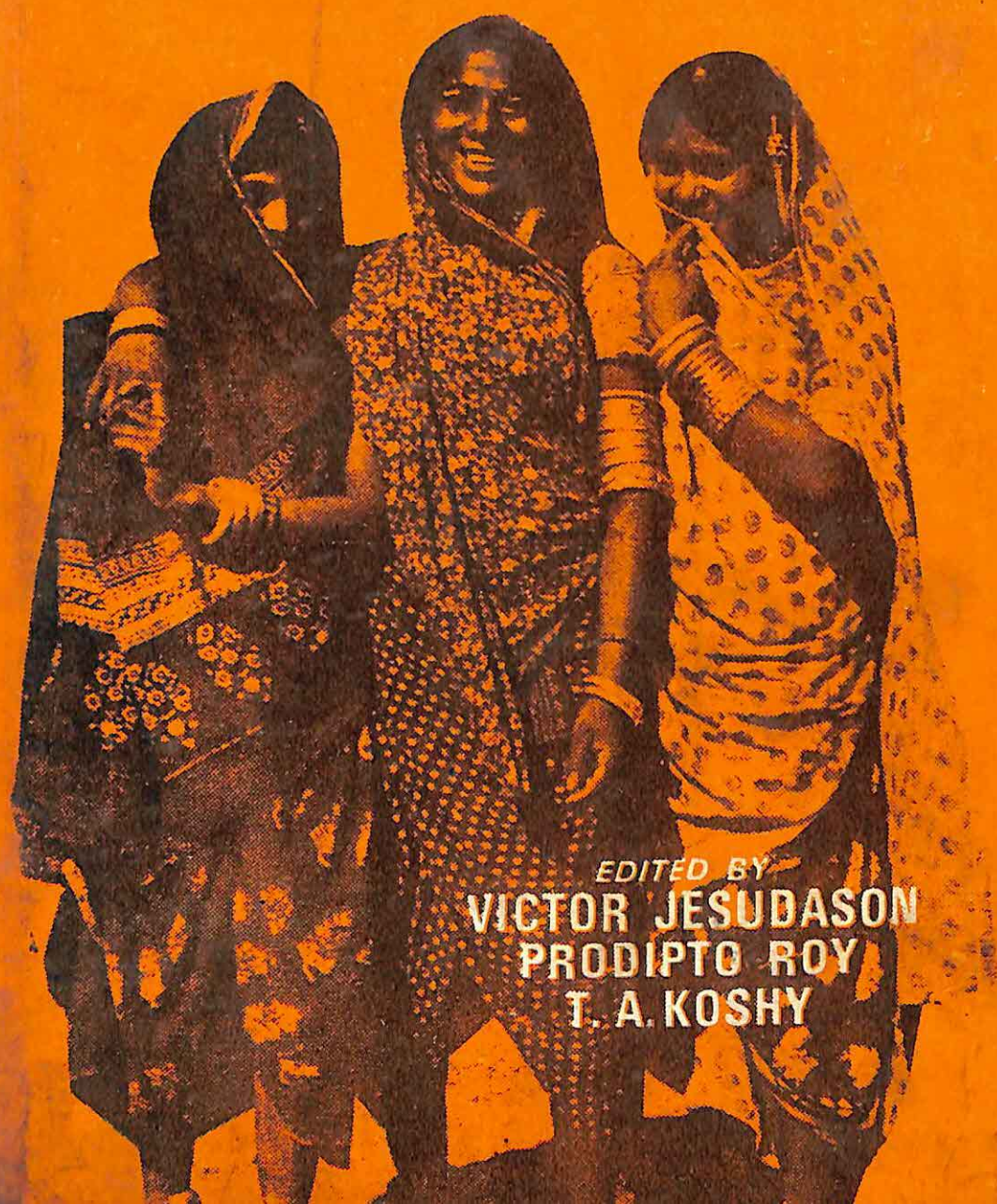


# Non-Formal Education for Rural Women



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NON-FORMAL EDUCATION FOR RURAL WOMEN

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# Non-Formal Education for Rural Women to Promote the Development of the Young Child

(An action-cum-research project integrating maternal and child health, nutrition, child care and family planning through functional literacy and Mother Child Centres, August 1972–August 1975)

*Edited by:*

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## FOREWORD

During the past quarter of a century a variety of programmes directed towards promoting the welfare of mothers and children have been carried out in India. Besides the programmes of the Ministry of Health and Family Planning, the Departments of Community Development, Education, and Social Welfare, have also had programmes dealing with maternal and child health, nutrition, child care, health and nutrition education. In spite of these programmes, more than half the deaths in India occur between the inception of pregnancy and the age of four. This enormous waste of maternal health and social and emotional energy caused by the loss of children, coupled with nutritional deprivation and physical and mental under-development among the surviving children has been a major obstacle to India's progress.

The Council for Social Development has been concerned about this problem for some time. In 1971 it reviewed the work that had been done in India in the fields of functional literacy, maternal and child health, nutrition and family planning and it came to the conclusion that an integrated approach was necessary to tackle this problem. It was also found that the policy of the Government was to provide integrated programme in these fields. However, one of the main barriers to the development of integrated programmes of education, health and nutrition was the low level literacy of rural women which was as low as 12.9 per cent in 1971. Hence, it was thought that an experimental project to test the effectiveness of functional literacy linked to these subject areas along with integrated services should be designed and tried out.

As a preliminary step, an informal meeting of experienced researchers, officials of the Government of India concerned with these programmes, representatives of WHO, UNICEF and CARE was convened by the Council on 19 November 1971 to explore some possible avenues of experimentation, the results of which might be useful for future planning.

In the discussion that followed, the consensus was in favour of conducting an experimental project integrating functional literacy



with maternal and child health, nutrition and family planning education, basic medical services and supplementary feeding of mothers and young children. Accordingly a project entitled "Non-Formal Education for Rural Women in Family Life Education" including the experimental design was prepared and submitted to UNICEF in May 1972 and the latter conveyed their intent in the first week of July to enter into a contract with the Council, subject to the final approval of the Department of Social Welfare, Government of India.

While awaiting the approval of the Government of India, UNICEF invited its consultant Dr. Lois-ellin Datta to come to New Delhi and also arranged for the Council to discuss with her the design of the proposed project. From her rich experience, she gave some valuable suggestions and the design of the project was substantially modified in the light of the discussions with her. The revised project entitled "AN EXPERIMENTAL NON-FORMAL EDUCATION PROJECT FOR RURAL WOMEN TO PROMOTE THE DEVELOPMENT OF THE YOUNG CHILD - An action-cum-research project integrating maternal and child health, nutrition, child care and family planning through functional literacy and Mother Child Centres" was submitted to UNICEF on 14 August 1972. On account of the disturbances in Andhra Pradesh at that time, there was some delay in getting the concurrence of the Government of Andhra Pradesh and the Government of India, Department of Social Welfare. The final clearance of the project by all concerned was conveyed to us by UNICEF in June, 1973. Thereafter the Department of Social Welfare set up a project Advisory Committee at New Delhi and the Government of Andhra Pradesh constituted a State Coordination Committee with the Collector of Mahbubnagar as the Chairman. These committees met from time to time and they have been very helpful to us in conducting the field programme, collection of data and distribution of nutritional supplements provided by CARE.

The study, which had two phases, was in operation in Mahbubnagar district of Andhra Pradesh since August 1972. The two phases have been completed and this is the final report of the study.

I take this opportunity to thank both the UNICEF and the Department of Social Welfare for the support and encouragement they have given to the Council for undertaking this study. I also thank the Government of Andhra Pradesh, the Collector of Mahbubnagar District, the Chairman and Secretary of the Zila Parishad and the District Medical and Health Officer, Mahbubnagar, for the valuable



assistance and cooperation extended to us for the operation of the project. The Panchayat presidents and members of the villages which were included in our study not only took a keen interest in the study but also helped us in securing accommodation in the villages for the Centre as well as for the staff posted in the villages, for which I am thankful to them. I am also grateful to all the participants in our programme villages without whose willing cooperation the experiment would not have proved successful. I thank CARE for their valuable assistance by providing food for supplementary feeding.

We have been able to complete the project successfully owing to the devoted and hard work of the directing, administrative and field staff of the project and eminent consultants whose services we were able to obtain. I thank them all for their whole-hearted endeavours to make the project a success. I also thank the UNICEF consultants and Mrs. Padmini Ramaswamy for the comments on an earlier draft manuscript of this book and Mr. D. Raghavan for editing the same.

New Delhi  
17 July 1979

DURGABAI DESHMUKH  
*Honorary Director*  
*Council for Social Development*



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**Part I**

**PREVIEW**

## CHAPTER I

# INTRODUCING THE PROJECT

T.A. Koshy & K.S. Bhat

The Genesis — The Primary Objective — Looking Back: Adult Literacy; *Gram Sikshan Mohim*; Farmers' Functional Literacy Project; Nutrition and Child Care; Mid-day Meal Programme; Special Nutrition Scheme for Children up to Six Years — Non-formal Education for Rural Women: Selection of the Project Area; Objectives — Project Mechanism: Functional Literacy; Mother Child Centres; Target Groups; Expected Results — Project Operation: Problem Surveys; Selection of Sample; Motivation Campaign; Two Specialised Measures.

### *Abstract*

A review of earlier attempts at bringing about improved nutrition, child care and functional literacy in rural area has been attempted. The genesis of this experimental study and the primary, long-term objectives of the four experimental treatments designed for conducting the programme are discussed. The project mechanism is described and expected results indicated.

### **The Genesis**

IN RECENT YEARS, there has been a growing recognition in the Government of India of the need for evolving an integrated approach to the development of the child. This has been due to the mixed experience attending the different programmes of various ministries in their attempt to evolve a basic package of Integrated Child Development Services (ICDS) which could be made available to all children in any programmed area such as the Community Development Block. There had always been complete agreement on the three distinct components of this package: Education, Health and Nutrition. Only the mix and the basic elements of each component in such an integrated programme were still to be worked out. It was at this stage that a decision was made to launch this experimental programme on a pilot basis during the Fifth Plan period.



The Council for Social Development undertook to implement this project, sponsored by UNICEF with the concurrence of the Government of India. The major objective was to evolve a basic package: to test two or three modes of delivery (treatments) in two *experimental phases*; and finally to test the effectiveness of the different treatments through a pilot project. After these two experimental phases, the Council would – from the teaching materials it had produced and tested and the basic health and nutritional services it had delivered – recommend a specified package of services in the field of non-formal education, health and nutrition for a third *pilot phase*. It would also suggest a staffing pattern and work out the costs of a viable delivery system which could be extended to cover all villages in a given area.

### **The Primary Objective**

A formidable barrier to development of the child has been the very low degree of literacy and education among rural women. The primary objective of this experimental project was, therefore, to develop an integrated programme through non-formal education of women in the rural sector. Such a programme was expected to bring about a significant decrease in infant mortality and morbidity, and an improvement in the physical, health and nutritional status of young children and pregnant and lactating women. The programme was also intended to improve their ability to acquire useful knowledge, both immediately and in the long run, so that they could foster the health and well-being of their family, particularly their young children. The non-formal education strategy would need to inform women at these levels about their health and nutritional well-being and motivate them to solve these essential problems.

Before the experiment was formally launched, a great deal of information and advice had to be garnered from knowledgeable individuals who had worked in or evaluated the work of similar programmes in the Ministries of Education and Welfare, Health and Family Planning, and Agriculture and Community Development. The project proposal was subjected to two or three revisions in order to specify its modes of experimental delivery and evaluation. Advisory Committees were set up both at the Central and the State levels for reviewing the work of the project from time to time. An important guideline for such reviews was that the integrated package being



developed should be workable within the manpower and financial resources of the country. Of necessity, an experimental social model must test many more things than what it will eventually recommend for dissemination. This is the basic difference between this experimental project and any other developmental project. The programme had to be designed from within and the guidelines and the research data had to be evolved on a trial and error basis.

### **Looking Back**

Developing nations have two major resources – the material wealth represented by natural resources, sources of power, and levels of industrial capacity; and the human resources represented by the level of education, technological skills, health, nutrition, etc., of the people. There has been an increasing awareness in the last decade or two, on the part of the developing countries, of the need and importance of developing human resources in order to make progress in national development. Programmes to develop human resources such as job training, functional literacy, health care, nutrition education, housing and recreation have thus emerged in India as well as in other countries.

It is against this background that the Council for Social Development undertook a review of work which had been attempted in India in these fields. A brief report of the review presented below indicates the present status and future perspectives in this specific sector of Indian experience.

*Adult Literacy:* Social education programmes with emphasis on adult literacy were initiated by the Government of India directly through the Departments of Education and Community Development in the States in the fifties. Adult literacy was a major part of a comprehensive programme of social education which included vocational, health, and civic education. Under these programmes two Social Education Organisers (one male and one female) had the responsibility for carrying out the work with the help of the *Gram Sevak* (village level worker), and under the supervision of the Block Development Officer. With the shift in emphasis on development of agriculture and Panchayati Raj institutions in the sixties, social education programme was snuffed out.

*Gram Sikshan Mohim:* In the year 1959, the State Government of Maharashtra launched an experimental programme of literacy known



as *Gram Sikshan Mohim* (Village Education Movement) in Satara district. This was later extended to other districts of Maharashtra in 1961. The literacy movement aimed at the eradication of illiteracy among the adults within the age-group of 14-50 (both men and women) through literacy classes. Booklets specially written for neo-literates on subjects intimately connected with the daily life of the village people were circulated. Social education centres were set up in villages to bring about all-round rural development. To a limited extent, the programme contributed significantly in breaking the age-old inertia of the adults taking to literacy.<sup>1</sup>

Then came the Pilot Project called 'Integrated Literacy Method'. This was initiated in 27 villages in Nilokheri Block in 1965. Sponsored by the Government of Punjab, the project was developed as a cooperative with the active assistance of the Ministry of Food and Agriculture, Government of India and the USAID. Initially, the project made some headway but there was no systematic follow-up programme built into the experimental project. The project was terminated in 1966.<sup>2</sup>

*Farmers' Functional Literacy Project:* In 1967, as part of the World Experimental Literacy Programme sponsored by UNESCO, the Government of India launched the Farmers' Training and Functional Literacy Project in 1967. Initially it was restricted to the High Yielding Variety Programme (HYVP) area in five districts.<sup>3</sup> By 1973-74, the project covered some 107 districts. Nearly 350,000 farmers are reported to have been made functionally literate while many thousands are under training. An evaluation of this national programme is being undertaken by the Directorate of Adult Education, Government of India.

The total impact of these and other efforts, particularly over the decade 1961-71, has been an increase in the rate of literacy from 24 to 29 per cent. The chief obstacle has been lack of interest or motivation on the part of the recipients to come to the classes regularly for the required 6-10 months. Other inhibiting factors were lack of commitment of the personnel, inadequate teaching and reading materials, and paucity of financial resources on the part of the Government or the private bodies to raise literacy instruction up to the standard at which literacy would be retained functionally.<sup>4</sup>

The real costs of bringing illiterate rural or urban men and women up to this basic minimum standard are much higher than what had been budgeted in the previous decade.<sup>5</sup> This is reflected in the



expenditure on the functional literacy effort now being conducted in 60 districts which links the new agricultural strategy in a functional and integrated manner to literacy. Even this programme is under-budgeted and needs to be qualitatively evaluated to determine the effect, both in achieving literacy and in increasing agricultural production.

*Nutrition and Child Care:* Programmes dealing with child nutrition and welfare are administered by the Departments of Social Welfare, Community Development, Health and Family Planning, and the Central Social Welfare Board, and in some cases with the support and cooperation of agencies like UNICEF and CARE.<sup>6</sup> The Maternity and Child Health services have normally been provided through the Primary Health Centres, Sub-centres and the Family Planning Clinics set up in Community Development Blocks. The staff consists of doctors, auxiliary nurse midwives, lady health visitors and family planning workers. The programme has been extended to all the 5,000 blocks in India; there are some three to five sub-centres in each Community Development Block. The programme has contributed to the reduction of infant and maternal mortality rate, as reflected in the general decrease of death rates in India.

*Mid-day Meal Programme:* In 1962-63, a fairly wide-ranging programme for providing a mid-day meal in the primary schools was started as a centrally sponsored project in every State.<sup>7</sup> This programme now caters to about 10 million children in the primary school age and about two million in the pre-school age. Additionally, during drought and national calamities such as cyclones, an emergency programme of feeding has been carried out for the pre-school age children and the pregnant and lactating women. This has been possible mostly through the CARE programme. At present between four and five million beneficiaries are covered under this programme.

*Special Nutrition Scheme for Children up to Six Years:* During the Fourth Five Year Plan, the Planning Commission, in cooperation with the Department of Social Welfare, introduced a programme of nutrition for children in the age-group of three to five years. The programme is being implemented with the help of *balwadis* and day-care centres. Another programme of the Department of Social Welfare for nutrition feeding of pre-school children was introduced in July 1970. Originally, this Special Nutrition Scheme was intended for children of 0-3 years. In 1971-72, the Department has extended the



programme and covered two million children as well as pregnant women and nursing mothers through our 15,000 feeding centres. The scheme is now extended to children up to six years in the States and the Union Territories since February 1971.<sup>8</sup>

### **Non-formal Education for Rural Women**

The above review and the discussions with programme workers and officials in the different States and at the Centre brought out the need for:

- (a) trying out functional literacy and non-formal education in the field of maternal and child health, nutrition and family welfare planning for women in the rural areas;
- (b) experimenting with an integrated programme of delivery of health and nutrition services.

Accordingly, the present project of Non-formal Education for Rural Women was designed with the objective of evolving a comprehensive programme on the basis of a critical assessment of the earlier efforts by official and non-official agencies.

*Selection of the Project Area:* A chronically drought-prone district in the Telengana region of Andhra Pradesh was selected for the project, as it manifested many of the social conditions of the most backward parts of India. It was presumed that an educational strategy which worked in such adverse conditions would succeed in any other part of India, particularly for the poorer sections of more advanced regions.

Two consecutive years of drought in Mahbubnagar district which resulted in overt symptoms of malnutrition, provided a wide range of medical and nutritional problems that needed to be tackled. It was primarily because of the proximity of social institutions immediately relevant to this project that this district was selected. But the results, we feel, may have wider relevance on account of the backward conditions in the district (truly representative of India's villages) under which the experiment was conducted.

*Objectives:* The main objective of the project was to evolve through experimentation a comprehensive, integrated programme which would, *first*, help decrease infant mortality and morbidity and improve the physical health and nutritional status of young children; *second*, increase the ability of rural women to acquire more useful knowledge

both immediately and in the long run; and *third*, foster their family's health and well-being particularly of their children.

In order to design a programme to fulfil the above objectives, it was proposed:

1. to develop, evaluate and improve teaching, reading materials with maternal and child health content for Educational Literacy and Mother Child Centres;
2. to test the immediate and long-term effects of integrated demonstrations in Mother Child Centres in selected villages on criterion measures and supplementary measures;
3. to test the immediate and long-term effects of Functional Literacy on criterion measures and supplementary measures in selected villages;
4. to test the immediate and long-term effects of integrated Mother Child Centres combined with Functional Literacy on criterion measures and supplementary measures in selected villages;
5. to identify the characteristics of the target groups to whom the programme is most likely to appeal and for whom the programme is likely to be most effective, moderately effective, and least effective;
6. to study the process of attrition in both the programmes and to determine motivational incentives and activities most likely to maintain a high level of attendance; and
7. to determine the organisational structure and costs necessary to conduct the separate as well as the joint programme and to recommend the most economic structure for the wider dissemination of the programme.

### **Project Mechanism**

For determining the most effective way of delivering these services, three experimental treatments with one control had been tested. They were:

(a) Functional Literacy Classes (FLIT) designed around the felt needs of the local rural women;

(b) Mother Child Centres (MCC), demonstrating the medical and nutritional practices needed to overcome their major maternal and child health problems;

(c) a combination of FLIT and MCC; and



(d) an experimental control (CONT) in comparable villages with no additional inputs other than what was available in the normal Government development programmes.

*Functional Literacy:* Functional literacy is the teaching of the basic skills of reading, writing and arithmetic, using the subject matter of a person's occupation or major interests. There is no reason why the process of learning to read and write should not be an opportunity for acquiring information that can immediately be put to practical use. Thus, the motivation for attending the classes was centred on the double advantage of acquiring knowledge and literacy skills which are connected with a person's occupation or major interest.

*The special feature of this project's functional literacy approach was the thematic perception of a subject through a photograph or an illustration which village women could immediately recognise as depicting a problem.* The problem was then represented by two or three key words in Telugu used locally to refer to this problem. These words were then analytically broken up into letters and synthetically reconstructed into other words, to teach the skills of reading and writing.

*Mother Child Centres:* A number of maternal and child health programmes are being operated through organisations such as *balwadis* and *mahila mandals*. The Mother Child Centres in this experiment represented a combination and extension of such programmes, with the focus on the same problems being dealt with in the Functional Literacy classes through the medium of non-formal education techniques, demonstrations, etc. The activities of these Centres were organised around regular ante-natal, natal, post-natal and immunisation services, a mother and child supplementary feeding programme and a non-formal education programme.

All the different strands of the programme were woven into a one-year curriculum, emphasising practical demonstrations. Supplementary feeding programmes, nutritional education, kitchen gardening and other methods used were aimed at bringing about a change in the quantity and quality of the diets of mothers and very young children and to ensure the quality of the child's physical and mental development. Delivery of medical services was conducted with the assistance of the existing traditional *dais* (birth attendants who deliver 90-95% of children) in rural India, the Auxiliary Nurse Midwives (Health Educators), Nurses (Maternity Assistants) and the Doctor appointed



under the project.

*Target Groups:* The project was designed for three target groups:

- pregnant women entering the last trimester of pregnancy;
- lactating mothers within the first six months of delivery; and
- mothers of children who are being weaned (aged 7 to 36 months).

*Expected Results:* The major results expected from this project were:

1. tested materials for a Functional Literacy programme for rural women; teaching materials relating to training, supervision and monitoring aspects;
2. tested organisational structure and programme materials for *Mother Child Centres; materials relating to teaching and audio-visual aids, staffing pattern, supervision and monitoring.*
3. *selection of the basic package of different integrated programmes;*
4. reliable data regarding the relative costs and effects in terms of man-power, materials, money and organisational structure needed to extend the project on a pilot basis; and
5. development of an adequate research methodology for evaluating the action programme.

## Project Operation

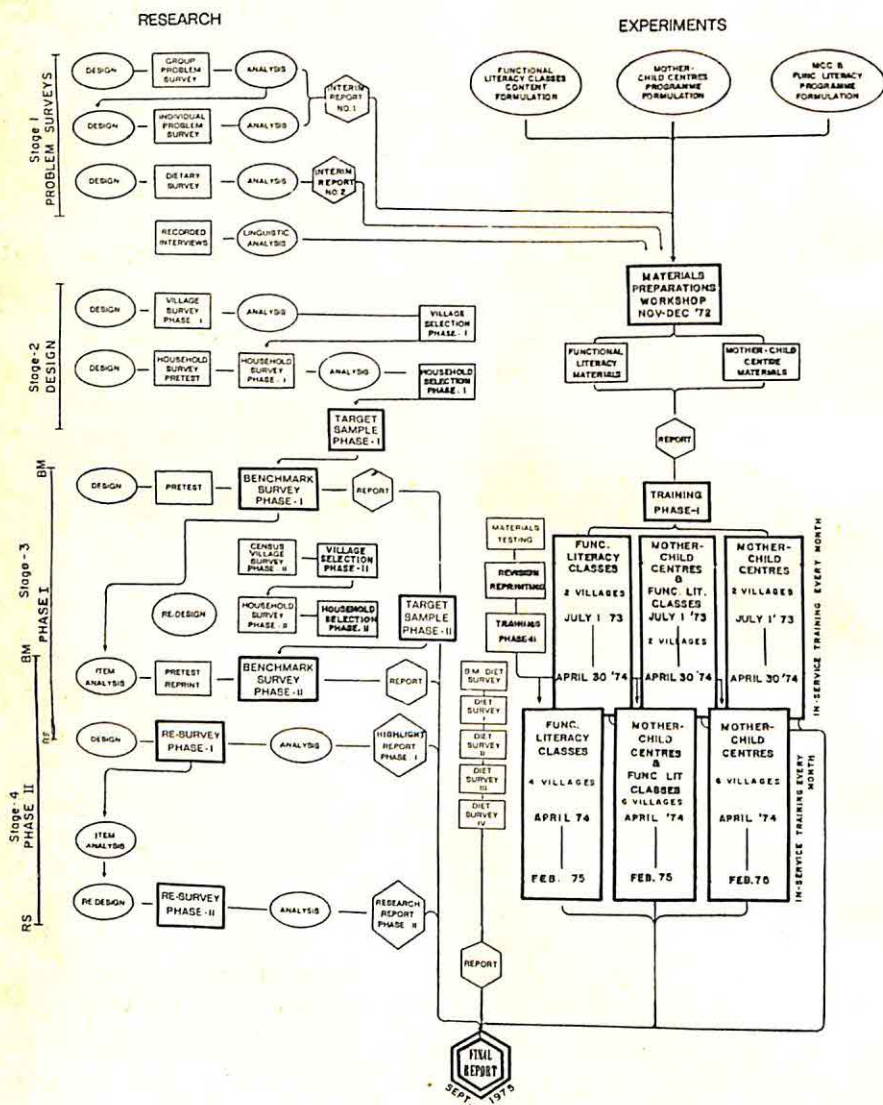
On the basis of the letter of intent received from UNICEF in July 72, field work of the project began on 1 August 1972 in Mahbubnagar district of Andhra Pradesh. The Branch Office of the Council, Hyderabad, was utilised and a Field Office for the project was established at Mahbubnagar.

There were two main components of the project which needed a great deal of coordination and sequential planning. It was therefore necessary at the outset to specify all the activities and carefully plan the entire time-phasing of the object. Figure I depicts all the research and experimental activities which were undertaken. For a variety of reasons, a few unavoidable delays led to slight re-adjustments and re-scheduling of one or two activities. The dates of actual execution have been shown in the Chart, mapped out in Figure I.

*Problem Surveys:* Field work of the project began with two Problem Surveys during July-September 1972. An exploratory Dietary Survey was begun in November 1972 to identify the problems of rural women



Fig.1. FLOW CHART OF STAGES &amp; EXPERIMENTAL TREATMENTS



in respect of maternal and child health, nutrition, family planning, and education. This was necessary since the problem-solving approach was to be adopted for the preparation of curriculum for Non-formal Education and Functional Literacy.

On the basis of the findings of these Surveys, an integrated curriculum was prepared which is given in Appendix I of Chapter IV. The teaching and reading materials based on the curriculum were prepared in a six-week Workshop held in Hyderabad during November-December 1972.

*Selection of Sample:* While the Workshop was in progress, research activities, consisting of village and household surveys were conducted to gather relevant data. On the basis of this data, selection of sample consisting of three categories of rural women, namely, pregnant women, lactating mothers, and weaning mothers was made. After the selection of the sample, the Bench Mark Survey was conducted to determine the level of knowledge and practice of the prospective participants about maternal and child health and other subjects included in the curriculum.

Simultaneously the printing of the materials prepared had to be completed; recruitment and training of the action-programme staff undertaken; accommodation for the Centres as well as residential quarters for field workers in their respective villages arranged.

*Motivation Campaign:* Before the actual initiation of the programme in each village, a motivation campaign was undertaken by a team consisting of the Project Officer, the supervisors and the teachers. The team contacted the village officials and explained to them the details of the programme chalked out for that village. Then the prospective participants were contacted individually or in groups. They were told what was expected of them and what benefits they would receive; their questions were answered and then they were requested to indicate if they would join the classes. Only those who gave an affirmative reply were finally enrolled in the classes which were to run for ten months, with six-day-a-week in the evenings, for about two hours daily. The same procedure was adopted for Phase I and Phase II.

*Two Specialised Measures:* Two specialised measures on infant development and cognitive structure of adults were used in the study; two psychologists who had been associated with adapting and standardising tests for Indian conditions were appointed as consultants to this project. The tests used were the Indian adaptation



of the Nancy Bayley Infant Development Scale and the Lowenfeld Mosaic Test. An in-depth analysis of motivation to attend classes was also made. Similarly a study on the Cost Effectiveness of the programme was made by another consultant with experience in this field.

The findings of this experimental project have been documented, analysed, annotated and critically examined from different points of view by experts, specialists, and field workers closely associated with the implementation of the programme in the chapters that follow.

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## CHAPTER II

# DESIGN OF EXPERIMENT

**Prodipto Roy**

Action Programme and Research — Programme of Action — Phases I and II — Hypothesis of the Study — Some Obstinate Field Problems — Testing the Impact of Three Experimental Treatments.

### *Abstract*

This chapter deals with the design of the experimental study, the problems around which the programmes were built and a brief description of the four experimental treatments.

THIS STUDY DEALS with the research and field aspects of a social experiment. Unlike the one-shot surveys, it provides the valuable 'intelligence' gathered during the experimental period about factors which would cause the change, keeping one or several variables constant. A number of sources causing change are tested. Social status variables, family variables and other demographic variables, both singly and jointly, and the effects of each on the others are also discussed.

There are far greater risks involved in social experimentation than in biological or physical science experiments. This is because man is less able to 'control' extraneous variables in the former. Many biological or physical scientists are, therefore, sceptical of social 'experiments'.

In almost any multiple regression equation in the social sciences, there is a high level of indeterminacy, and a high proportion of variance not explained ( $1 - R^2$ ). This leaves a great deal of room for the 'intuition' of the social scientist.

Empirical researches in social sciences are conducted in a variety of settings and contexts. The choice of a setting for any research project, by and large, is guided by the nature of questions being asked, the type of answers sought and the degree of control desired. If the setting is large, covering a wide geographical area, usually survey methods are



used. In such studies, the degree of control a researcher is able to command may be less. When the setting is small and sequential studies needed, as in this project, field experiments are more appropriate. We, therefore, opted for a field experimental design.

### **Action Programme and Research**

This experiment has been designed on two basic parameters – Action Programme and Research. The action programme workers collected the data and kept records which were used for research. The research programme itself had two components: (1) research which was fed into the action programme, including a *feed-forward*, such as problem surveys, dietary surveys, etc., and a *feed-back* system evaluating each lesson unit of the teaching materials for purposes of revision; and (2) the Bench Mark Surveys and Resurveys to measure the impact of the action programme. We shall describe here the latter – the design of the experiment to measure the impact of the action programme. The former will be discussed in Chapter III along with the action programme.

### **Programme of Action – Phases I and II**

It was decided to carry out the study in two phases. Phase I of this project was a pre-test of the experiment. Phase II was the actual experiment. Phase I was a pre-test since the action programme was a brand new model, in some ways anticipating the Integrated Child Development Service package, and the coverage was too small for sophisticated statistical tests.

The teaching materials were essentially untried materials based on ‘best guesses’. The Mother Child Centres were new social constructs based on the experiences gained in *mahila mandals*, *balwadis*, Health Sub-Centres, pre-school feeding centres, etc. Again, rural women’s functional literacy was and still is only an ideal which is yet to take root anywhere in India. Lastly, the village level staff, supervisors and Project Officers for each experimental treatment had to get the programme on the ground to work out details about operations, logistics, span of control, etc. In short, this eight-village pre-test was necessary to prepare the ground for the wider experimental test to follow.

Operationally, since each experimental treatment or intervention

was only in two villages, the size of samples was rather small. This was especially true in the functional literacy treatment alone, which had poor attendance. Hence no sophisticated statistical tests could be applied when presenting these data. However, standardising the measures within the questionnaire, putting all the data through cards to tapes and de-bugging the package programmes on the computer were procedures that helped reduce data processing time and measurement errors in Phase II.

For both Phases I and II we had four experimental treatments: (i) a functional literacy class (FLIT), (ii) an oral instruction-cum-demonstration education, providing medical advice, services, and a feeding programme (MCC), (iii) a combined (FLIT + MCC), and (iv) control villages (CONT) in which only the normal community development and health programmes were operating, to reflect the normal background which could be expected even if no experiments were being conducted.

### Hypothesis of the Study

The experimental treatments were expected to result in changes beyond those of the control villages. A tabular presentation of the experimental design is given below:

Experimental treatment	Scores in Bench Mark Survey	Scores in Resurvey	Gain scores
CONT	$X_1$	$Y_1$	$Y_1 - X_1 = G_1$
FLIT	$X_2$	$Y_2$	$Y_2 - X_2 = G_2$
MCC	$X_3$	$Y_3$	$Y_3 - X_3 = G_3$
MCC + FLIT	$X_4$	$Y_4$	$Y_4 - X_4 = G_4$

Theoretically, all three experimental treatments should show significantly greater gains than the control. A simple Student's 't' test was used to test the significance of each of these comparisons.

$$G_2, G_3, \text{ or } G_4 > G_1$$

Further, we hypothesised that the combined treatment would show the greatest gains, the MCC the next largest and FLIT the lowest.

$$G_4 > G_3 > G_2 > G_1$$



For the literacy tests this order would be slightly altered:

$$G_4 > G_2 > G_3 > \text{or } G_1$$

For the medical and nutritional tests, the two service treatments MCC and MCC+FLIT were combined and labelled 'service' and compared with the two 'non-service' treatments. The hypothesis was therefore:

Service > Non-service

The experimental programmes were built around ante-natal, natal, post-natal and early childhood problems. Hence the criterion variables on which we would expect gain scores were specific skills, knowledge, attitudes, and certain health and nutritional status measures or items. These items provided the yardstick for measuring the extent and level of change in the different segments of the programme and covered the broad areas of the study. These variables and three global measures or items against which change was measured were:

1. *Health Care:*

A. General Health	6 items
B. Child Health	3 items
C. Child Diseases	6 items
D. Pregnancy Problems	2 items
Total	<hr/> 17 items <hr/>

2. *Nutritional Care:*

A. General Nutrition	8 items
B. During Pregnancy	4 items
C. During Lactation	3 items
D. Child Nutrition	3 items
Total	<hr/> 18 items <hr/>

3. *Food Taboos:*

A. During Pregnancy	12 items
B. During Lactation	12 items
Total	<hr/> 24 items <hr/>

4. <i>Nutrition Facilities:</i>	3 items
5. <i>Family Planning:</i>	
A. Knowledge	5 items
B. Attitude	5 items
Total	10 items
6. <i>Literacy:</i>	
A. Reading	Percent of 64 items
B. Writing	Percent of 6 items
C. Arithmetic	Percent of 29 items
Total	Percent of 99 items
7. <i>Global Measures (General Knowledge):</i>	
A. Economic	2 items
B. Mass Media	2 items
C. Aspiration	2 items
Total	6 items
8. <i>Nutritional Deficiency Symptoms of Children:</i>	
A. PCM (Protection, Calories, Malnutrition)	3 items
B. Vitamin A Deficiency	3 items
C. Vitamin B Deficiency	4 items
D. Iron Deficiency	4 items
Total	14 items
9. <i>Nutritional Deficiency Symptoms of Women:</i>	
A. PCM	3 items
B. Vitamin A Deficiency	3 items
C. Vitamin B Deficiency	4 items
D. Iron Deficiency	4 items
Total	14 items



10. *Physical Measurements:*
  - A. Weight
  - B. Height
11. *Psychomotor Development (Bayley Scale of Infant Development)*
  - A. Motor Development 167 items
  - B. Mental Development 163 items
12. *Cognitive Structure* (Lowenfeld Mosaic Test)

### Some Obstinate Field Problems

During Phase I the Bench Mark data were either not gathered or inadequately measured for a number of these variables. This was due to the fact that programme content was not fully operationalised at that time. For example, the nutritional deficiency symptoms were only measured in the post-survey. Some of the early attempts at the complete medical check-up proved almost calamitous. It was the first time any doctor had been to the village. Interviewers, eaves-dropping on the conversation of women, after a medical check-up including blood, urine and blood-pressure tests reported: "First – she took all my blood, then urine and then she took all the air out of me."

We were confronted with a large number of refusals to the complete medical check-up during the Bench Mark Survey. This resulted in a cut-back on the number of medical tests. It was only when a great deal of rapport and confidence in the medical system had been established that we decided to conduct an adequate but more modest medical Bench Mark Survey about a month after the programme had started. This had, however, posed measurement problems in the non-service villages and analytical problems for the experiment. The doctor's medical check-up was itself a part of the action programme and therefore resulted in a 'contaminating' medical demand structure which had a deleterious effect on the non-service treatments – the control and the experimental literacy group. Hence while some nutritional and medical symptoms have been observed in the pre and post or resurveys, the continuing health and nutritional morbidity record or even the height and weight data were kept only for the service programmes during the experimental period. Inferences, therefore, needed to be drawn from either the post data alone or from trend data within the experimental period for Phase I.

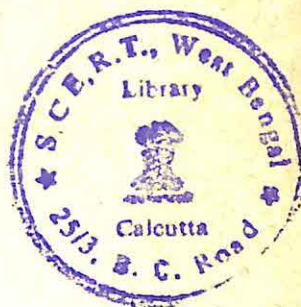
**Testing the Impact of Three Experimental Treatments**

These experiences with Phase I data collection and measurement helped to improve the instruments which were to be used in Phase II. The analysis of Phase I data has not been presented in this report except incidentally as part of the post-post-survey conducted in the Phase I sample of respondents to study how durable were the gains in knowledge one year after the termination of the action programmes. The field work for this Phase I post-post-survey was conducted at about the same time as the Resurvey of Phase II villages. Although for the psychomotor development and cognitive structure Phase I data are also presented, the latter of these studies was done only in Phase I.

This final report therefore relies mainly on the Phase II data to test the effects of the three experimental treatments. The findings will present data on the theoretical hypothesis outlined above. They are also expected to provide a clear answer to the question: Are the net gain scores of each experimental treatment significantly higher than the control?

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## CHAPTER III

# PROBLEM SURVEYS

**T.A. Koshy**

Group Problem Survey — Individual Problem Survey — Exploratory  
Dietary Investigation — Summary of Findings.

### *Abstract*

Three Problem Surveys were conducted. They were: Group Problem Survey; Individual Problem Survey; Exploratory Dietary Investigation. Details of these Surveys and their specific objectives and findings are explained.

THERE ARE MANY recommended approaches for the preparation of curriculum and teaching materials in functional literacy and non-formal education. We adopted for this project the problem-solving approach as it is considered to be the most useful.

For identifying the problems relating to maternal and child health, nutrition, family planning, literacy and education, it was necessary to undertake three problem surveys among the prospective participants. The three surveys were: (a) Group Problem Survey; (b) Individual Problem Survey; and (c) Exploratory Dietary Investigation.

The specific objectives of the Problem Surveys were:

- to determine the felt needs and immediate problems relating to maternal and child health, nutrition, family planning and literacy;
- to prepare a word-list of the terms (including colloquial expressions) used by the people in regard to the above problems;
- to identify the degree of awareness of the problems relating to maternity health, nutrition, child development, family planning and literacy;
- to collect information on the beliefs, misconceptions, attitudes and current practices relating to the above subjects; and
- to identify the degree of awareness of the existing (service) facilities in respect of the above and the extent of utilisation of such facilities.

### **Group Problem Survey**

During the survey carried out in July 1972, as many as 241 women in 27 villages were contacted. They were formed into 41 groups and were interviewed in groups. Questions were so framed as to elicit community pattern of behaviour rather than individual behaviour. The information and data regarding community ideas on actual/ideal age for marriage; attitude and practice towards abortions, miscarriages and sterility; extent and causes of infant mortality; diet during pregnancy and lactation, and work pattern in the house/field, etc., were taped. This investigation provided the needed information to plan and operationalise the second problem survey which was carried out on an individual basis.

### **Individual Problem Survey**

For this survey, carried out in September 1972, 21 villages were selected. In each of these villages, 7 or 8 women in the age-group of 15-45 and with at least two children were interviewed. A total of 131 women were covered. Since our intention was to gather as much information as possible about nutritional and health practices and problems, many open-ended questions were recorded verbatim. These responses were later searched for clues in the preparation of material for functional literacy/non-formal education. Nineteen of the interviews were also tape-recorded. They were later studied by linguists to delineate the syntax, structure and use of local dialect. This again was used in the preparation of material for functional literacy classes. In addition, the verbatim answers also provided categories for precoded schedules to be used in future surveys.<sup>1</sup>

### **Exploratory Dietary Investigation**

This survey was conducted during November-December 1972. Three hundred and twelve households in 16 villages were covered. The survey also collected information on terms used by the local people to denote various foods, names of food preparations and descriptions of the dietary pattern and habits. Special attention was paid to information on young children's diet, and food taboos during pregnancy and lactation.<sup>2</sup>



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### **Summary of Findings**

It was found that the rate of infant and child mortality was very high. A high proportion of the children died either during the first year of life or between the ages of 2 and 3 years during the weaning stage. The child mortality was higher in the early parities than in the later parities. The results of the surveys revealed by their frequency of occurrence the relative importance of the different health problems experienced by a mother during pre-natal, natal, and post-natal periods. The level of information, knowledge and practice of family planning methods was low. Though most of the respondents expressed a favourable attitude towards literacy and education, literacy skill was seen by most of them in the vocational (white-collar job) context only.

The dietary investigation revealed that the diet of the majority of people consisted mainly of cereals. Vegetables and pulses were consumed by less than 25 per cent of the sample. Meat, milk and curd were consumed by a very small proportion of the sample. About 26 items of food that are regarded as taboos either during pregnancy or lactation were also identified. These findings were made available to those who were in charge of developing the curriculum for non-formal education and functional literacy classes.

### **Notes and References**

1. A report on Problem Surveys was presented to UNICEF in April 1973 as Interim Report No. 1.
2. A report on Exploratory Dietary Survey was presented to UNICEF in April 1973 as Interim Report No. 2.

**Part II**

**MATERIALS AND COMPONENTS**



## CHAPTER IV

# CURRICULUM DEVELOPMENT AND PREPARATION OF MATERIALS

**T.A. Koshy**

Workshop for the Preparation of Materials — Course Content — Unitisation of Lessons.

### *Abstract*

The methodology followed in the preparation of course materials for the programme of Non-formal Education is explained. Details of curriculum content are indicated.

THE CURRICULUM FOR non-formal education and functional literacy was developed on the basis of the findings of the problem surveys. The salient findings, together with the problem areas identified, and the curriculum content developed, are given in a tabular statement at the end of the chapter (Appendices 1 and 2).

Based on the major findings, the course content for oral instruction-cum-demonstration in Mother Child Centres as well as for Functional Literacy Centres was prepared in English. This was translated into Telugu, and used in Phase I of the project. It was later revised on the basis of observations by the teachers, supervisors and Project Officers. The revised course content (finalised in February 1974) was used in Phase II. A few changes were also made on the basis of the experience in Phase II.

### **Workshop for the Preparation of Materials**

A Workshop for the preparation of teaching and reading materials for non-formal education and functional literacy was held at Literacy House (South), Hyderabad from 9 November to 16 December, 1972. The participants consisted of writers, linguists, adult educators, artists, photographers, resource persons and consultants, besides the directing staff of the project.

The findings of the problem surveys were made available to the participants. The method of presentation was discussed and it was decided that in both the non-formal education (oral instruction-cum-demonstration without literacy) classes and in the functional literacy classes, the problems for discussion would be posed through a photograph or a set of photographs depicting the problem. The participants were then divided into two groups: one to prepare materials for functional literacy, and the other to prepare materials for non-formal education in Mother Child Centres. Periodically, the two groups met and discussed the draft materials prepared by each group and modifications were made in the light of the discussion. The draft materials were also pre-tested in some villages in Rajendranagar Block in Hyderabad district and further modified in the light of test results. Through the courtesy of the Director, Directorate of Adult Education, Government of India, the services of a UNESCO Expert on preparation of materials for functional literacy were made available to the Workshop, as one of the consultants.

### **Course Content**

Scripts were finalised by the Workshop on the following aspects of the programme based on specific topics in the course content.

1. Functional Literacy teaching material in Telugu entitled 'Mata Sisu Samkshema Saksharata' (Mother Child Welfare Literacy).
2. Outlines of the following folders in Telugu as supplementary readers for new literate women:
  - Kaalam Maarindi (Times have Changed).
  - Garbhinee Sthreelu-Doctor Pareeksha (Medical Check-up of Pregnant Women).
  - Garbhinee Sthreelu-Konni Sustheelu (Minor Ailments during Pregnancy).
  - Garbhinee Sthreelu-Konni Gandalu (Abnormalities in Pregnancy).
  - Puttina Sisuvu Jaagrathalu (Care of the new born baby).
3. Discussion Guide in Telugu entitled 'Mata Sisu Samkshema Vidya' (Mother Child Welfare Education).
4. Design of a few visuals relating to selected topics in the course content.

The participants also selected a set of visuals from those already



collected from different sources for illustrating the topics in the course content.

### **Unitisation of Lessons**

It was found essential to break the topics and sub-topics further into simple unitised lessons for the following reasons: for preparing Weekly Lesson Guides for teachers and health educators; for collecting feedback data for revision of materials; and for bringing about a certain amount of uniformity in coverage of subjects by the different classes. The teachers and Health Educators could also plan the lessons for each day more effectively. Finally unit lessons also facilitate supervision of classes by the Supervisors/Maternity Assistants and Project Officers.

Therefore, unitised lessons based on the course content were prepared. These indicated the subject-matter to be covered, the messages to be transmitted in each lesson unit and the questions which the teacher may ask to initiate discussion. A total of 152 lesson units were prepared in Telugu before the commencement of action programme in Phase II of the project and were distributed to the teachers/Health Educators and their supervisors, after training them in the use of the unitised lessons, particularly for lesson planning.

## APPENDIX I

## Findings of Problem Surveys and Curriculum Content

Findings of Problem Surveys	Problem Area	Curriculum Content
1. Women married at the age of 11; did not have any check-up during pregnancy; child-birth started at 14; confinements at home, attended by local <i>dai</i> ; experienced health problems following delivery; 60% of the first born died.	Too early marriage and high infant mortality, especially among the first born.	A healthy mother has a healthy baby, (Confirmation of pregnancy; ante-natal care; need for check-up; ailments during pregnancy; warning signs of abnormality; vulnerable periods.)
2. Women did not take special or extra food during pregnancy or the nursing period.	Malnourishment in expectant and nursing mothers.	Nutritional requirements during expectant and nursing periods.
3. The majority of children suffered from, or died due to, diarrhoea, dysentery or worms; weaning foods were not known or prepared in the community; <i>Nanju</i> (K washiorkar) and <i>Kattia Nanju</i> (Marasmus) were recognised as common occurrences among infants and toddlers.	High toddler morbidity.	Nutrition and health care of infants and toddlers; prevention of communicable diseases; child development and rearing function; recognising early symptoms of <i>Nanju</i> and its steady treatment.
4. With the exception of the small-pox vaccination, immunisation was unknown.	Unawareness of prophylactic care of child illnesses.	What is immunisation, why and when it should be adopted.
5. Negative attitudes to the Family Planning Programme; poor knowledge of any form of contraceptives, with low adoption rates.	Large family size.	Family Planning.
6. Low literacy rate among women (about 3%); education was recognised as a means of white-collar employment only.	Illiteracy.	Need for literacy in the common day-to-day uses of life.



## APPENDIX 2

## Course Content for Oral Instruction-cum-Demonstration in MCC and Functional Literacy Classes

S.No.	Subject Area	Topic	Sub-Topics	Break-up of sub-topics
1.	Maternal health care for a healthy baby	1.1 Maternal Care	1.11 Antenatal Care-(Care of the expectant mother) necessity  1.12 Pregnancy (prenatal growth of baby)  1.13 Factors that influence prenatal growth of the baby  1.14 Warning symptoms of abnormal pregnancy and precautions to be taken	1.11 a) Expectant period is a period of vulnerability. b) It is vulnerable as it lays the foundation for a healthy child. c) Needs of vulnerable periods are congenial environment for promotion of optimum growth. 1.12 a) Prenatal growth of the baby in the first three months. b) Growth of the baby in the second three months. c) Growth of the baby in the last three months. 1.13 a) Effects of nourishment at different stages of pregnancy. b) Minor ailments and their effect on the mother. c) Abnormal conditions associated with pregnancy. 1.14 a) What are warning signs of abnormal pregnancy? b) What to do?

(Contd.)

## APPENDIX 2 (Contd.)

S.No.	Subject Area	Topic	Sub-Topics	Break-up of sub-topics
			1.15	1.15
			Care during antenatal period	a) Confirmation of pregnancy. b) Confirmation that pregnancy is normal and that the child in the womb is growing normally. c) Steps to be adopted for a healthy pregnancy. d) Where to go for check-up? e) When to go for check-up?
			1.16	1.16
			Care of the mother at confinement	a) preparation for confinement at home. b) When to call a <i>dai</i> . c) Recognition of difficulty in labour and what to do?
			1.17	1.17
			Care of lying in mother	a) Personal cleanliness of the mother. b) Avoidance of postnatal fever. c) Care at lying in period.
			1.18	1.18
			Care of the new born baby	a) Care of the normal baby. b) Care of the premature and low weight baby. c) Care of the new born sick baby.
			2.11	2.11
			Functions of food	a) What does the food do to us? b) Definition of nutrition and nutritive classification of food groups. c) Food groups.
2.	Nutritional requirements of expectant and nursing mother.	2.1 General characteristics of food		



- |   |  |
|---|--|
| <p>2.12<br/>Food habits</p> <p>2.13<br/>Malnourishment<br/>illnesses among<br/>the women</p> <p>2.14<br/>Wholesome food</p> | <p>2.12<br/>a) Food beliefs and taboos.<br/>b) Food habits, their effects in terms of faulty consumption.</p> <p>2.13<br/>a) Prevalent nutritional deficiency illness among expectant and nursing mothers.<br/>b) Corrective food habits to counteract nutritional illnesses.</p> <p>2.14<br/>a) How food gets contaminated?<br/>b) Prevention of food contamination practices in terms of procurement, storage and preparation of food.<br/>c) Conservation of nutrients.</p> |
| <p>2.2.<br/>Nutrition in pregnancy<br/>and lactation</p> <p>3.1<br/>Dietary care of<br/>infant and toddler</p>              | <p>2.21<br/>Specific requirement<br/>of mothers</p> <p>3.11<br/>Diet of the child</p>  |
| <p>3.<br/>Nutritional<br/>care of infant<br/>and toddler</p>  | <p>3.12<br/>Factors that influence the diet of the child</p>   |

(Contd.)

## APPENDIX 2 (Contd.)

S.No. Subject Area	Topic	Sub-Topics	Break-up of sub-topics
4.	3.2 Malnourishment among infant and toddler	3.21 Nutritional illness among infant and toddler	3.21 a) Recognition of malnourishment b) Kwashiorkor, marasmus and avitaminosis. c) Corrective food habits for infant and toddler.
	4.1 Growth pattern	4.11 Growth is gradual and follows a regular pattern	4.11 a) Growth pattern in infancy (normal). b) Growth pattern in infancy (Recognising changes and action to be taken). c) Growth pattern in toddlers (normal). d) Growth pattern in toddlers (Recognising changes and action to be taken).
	4.2 Habits of daily life	4.21 Factors that promote personal cleanliness and public health	4.21 a) Cultivating habits of personal cleanliness in a child. b) Cultivating habits of cleanliness in food. c) Cultivating habits of cleanliness in dressing. d) Cultivating healthy habits that promote and preserve both personal and public health.
	4.3 Developing skills in a child	4.31 Development of some skills in a child	4.31 a) Psychology of a child. Psychology of parents. b) Care to be taken to avoid defects in speech and gait which are avoidable. c) Teaching the making of paperboats, toys and models with clay, paper pulp and empty match-boxes. d) Colour schemes, coordinating activities. What the mother can do to improve skills in the child.



5.	Health care of infants and toddlers		
4.4	Developing socialability in toddlers	4.4	Shaping a child to be a good mixer in society (through games)
5.1	General information of illnesses	5.11	Definition of illnesses and causes
		5.12	Sanitary practices for prevention of illnesses
5.2	Communicable illnesses among infant and toddler	5.21	Definition of Communicable illness and specific preventive steps to be adopted
5.3	Immunisation	5.31	Immunisation
5.4	First aid. Accidents among infants and toddlers	5.41	First aid. Accidents among infants and toddlers
		4.41	Games for children.
		b)	His/her position in relation to teaching the child to recognise others in the family.
		c)	Cultivating team-spirit and the right way of taking success and defeat in games.
		5.11	Illnesses and their types.
		b)	Causes of illnesses.
		c)	Spread of illnesses.
		5.12	Personal cleanliness.
		b)	Environmental cleanliness.
		c)	Cleanliness-individual practices.
		5.21	What is communicable illness and precaution in general to stop the spread.
		b)	Communicable illness Group I (caused by bacillus).
		c)	Communicable illness Group II (caused by virus).
		5.31	What is immunisation?
		b)	Immunisation of infant and toddler.
		5.41	Causes of accidents.
		b)	Precautions for prevention of accidents.
		c)	First aid in accident.

## APPENDIX 2 (Contd.)

S.No.	Subject Area	Topic	Sub-Topics	Break-up of sub-topics
6.	Responsible parenthood	5.5	5.51	5.51
		First aid in emergencies of illnesses among infants and toddlers	First aid in emergencies of illnesses among infants and toddlers	a) Bites.
		6.1	6.11	b) Asthmatic attack.
		Effects of large family	Effects of large family	c) Fits.
7.	General knowledge and information about services	6.2	6.21	d) Dehydration.
		Contraception	Contraception	6.11
		7.1	7.11	a) Effects of large family on health of mother and child.
		General knowledge	General knowledge	b) Effects of large family on child rearing.
				6.21
				a) What is contraception and contraceptive methods - temporary/permanent.
				b) Temporary contraceptive methods.
				c) Permanent contraceptive methods.
				7.11
				a) Year, month and days.
				b) Names of months, English and Indian and their order.
				c) Names of days of the week.
				d) Important festival days.
				7.12
				a) A day has 24 hours.
				b) An hour has 60 minutes.
				c) Dial of a clock and practice in reading different hours and minutes.
				d) Train journey.
				e) Working of post office.



7.2	Information on health facilities	7.21	Primary health centre and sub-centre	7.21	a) Location of primary Health centre/sub-centre, serving the village. b) Clinic hours and services available at P.H.C. and sub-centres.
		7.22	Family planning centre	7.22	a) Location of family planning centres other than at P.H.C. and sub-centres. b) Types of services available at the centre.
7.3	Agriculture and development facilities	7.31	Agriculture and development facilities	7.31	a) Agriculture supports about 80% of the people. b) Prevention of soil erosion and loss of soil fertility. c) Modern agricultural practices; rice crop. d) Modern agricultural practices; jowar crop. e) Modern agricultural practices; 'Aruna' castor. f) Modern agricultural practices; sun flower, groundnut etc. g) Vegetables and their importance in nutrition. h) Large-scale cultivation of vegetables in solving problems of food and unemployment. i) Cultivation of some vegetables; brinjal, tomato, carrot in small plots. j) Poultry; production of more eggs. k) Location of Panchayat Samithi in which the village is included. l) Services available through V.D.O. (Village Development Officer). m) Location of main and subsidiary markets.

(Contd.)

## APPENDIX 2 (Contd.)

S.No.	Subject Area	Topic	Sub-topics	Break-up of sub-topics
		7.4	7.41	7.41
		Citizenship	Citizenship	a) Who is a citizen? b) Rights and duties of a citizen. c) What is vote? d) Who are the persons eligible to vote? e) How to exercise a vote? f) What is democracy? g) What is autocracy? h) What is the form of Government that ensures freedom?
		7.5	7.51	7.51
		Local self-government (Panchayati Raj)	Local self-government (Panchayati Raj)	a) Village Panchayat; elections of members and Sarpanch. b) Functions of a Village Panchayat. c) Panchayat Samiti – Composition and election of the Chairman. d) Zilla Parishad – Composition and election of the Chairman. e) Functions of Zilla Parishad.
		7.6	7.61	7.61
		State Government	State Government	a) Legislative Assembly of the State. b) Election of Members to the Assembly. Composition of the Assembly. Members from the District. c) Legislative Council, election of members, nomination of members and total strength. d) Functions of Legislative Assembly and Council. e) Party Government; Majority; Opposition; Election of Leaders. f) Chief Minister and Council of Ministers. Democratic form of Government.



## CHAPTER V

# FEEDBACK FOR TEACHING MATERIALS

**T. Anjaneyulu**

The Daily Log Sheet: The Schedule — Typical Questions — Class Attendance: Message Content of the Lessons; Visuals — Literacy Components — Nutrition Demonstrations — Inter-village Variations — 'No time to cook'.

### *Abstract*

One of the major objectives of the project was to develop a set of tested materials for Functional Literacy and Non-Formal Education classes for rural women. This chapter describes the methodology adopted for testing the materials in the classes through a feedback system.

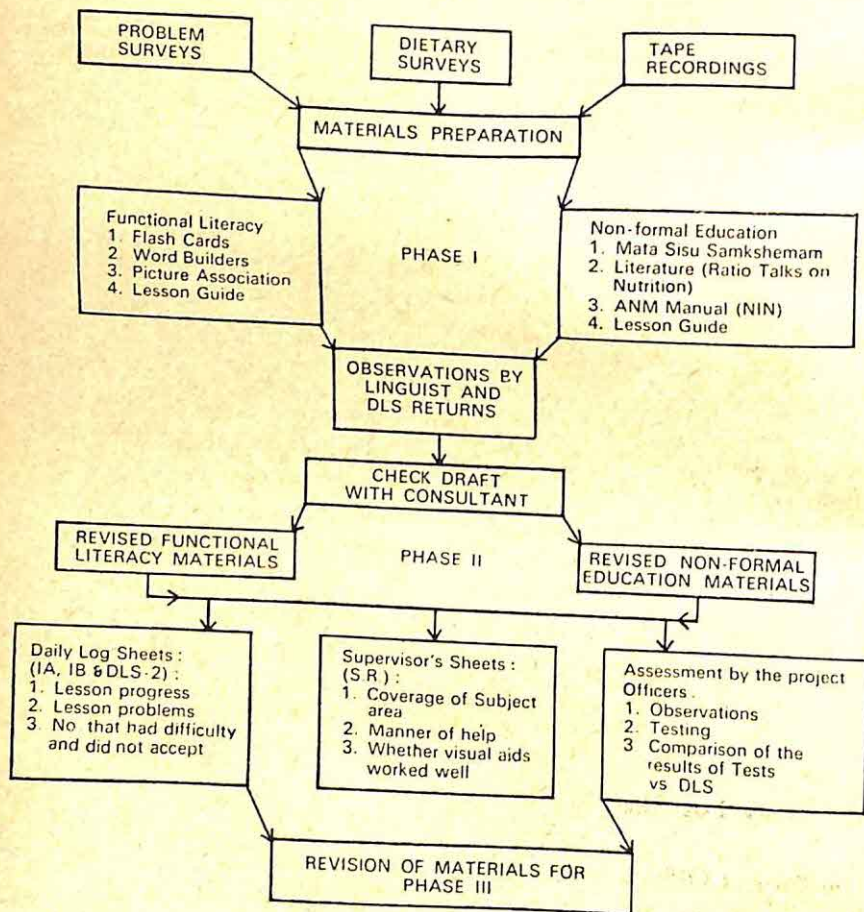
THE MAJOR FACETS of revision of materials and the place of feedback in such a system are shown in the Flow Chart (page 40) which graphically displays the process of testing and revision of the materials. The information flow from one stage to another, and the operations carried out at each of the stages are intended to ensure fool-proof teaching materials.

In Phase I the curriculum was based on problems arising out of problem surveys, dietary surveys and tape-recorded interviews. In Phase II the materials revised in Phase I were used for both functional literacy and non-formal education classes.

### **The Daily Log Sheet**

The Project Officer (Materials) and Project Officer (Literacy) visited the centres and noted down some of the salient points which could help in the revision of materials. For obtaining the required information on the same lesson unit from all the centres, daily log sheets were introduced and the required information collected through them. These daily log sheets were collected and checked by the respective Health Educators/Teachers and were finalised for

Flow chart of Monitoring the Evaluation and Feed-back System for Testing and Revision of Teaching Materials





tabulation every fortnight. These reports helped the Project Officers in the revision of the materials.

*The Schedule:* The major source of information for the revision of materials was the Daily Log Sheets (DLS). These schedules were completed by the Functional Literacy teacher or Health Educator as soon as the classes were over. The three Daily Log Sheets were:

- (1) Daily Log Sheet for Functional Literacy Classes (DLS-IA)
- (2) Daily Log Sheet for Non-formal Education Classes (DLS-IB)
- (3) Daily Log Sheet for Nutrition/Health Demonstration (DLS-2)

The Supervisor's Weekly Summary (SWS-1) was later converted into a Daily Report.

As most of the items in these forms were precoded, answers were generally to be circulated by the Health Educators/Literacy Teachers/Supervisors. Very few of the open-ended questions were to be answered by them. Each of these forms took about 20 minutes for any one to fill up. When the Teachers/Health Educators/Supervisors came to the Field Office (Mahbubnagar) for their periodical meetings, they were individually briefed regarding the materials, attendances, receptivity and barriers in the classes.

### **Typical Questions**

Some typical questions given in the Schedules were:

- 'What was the lesson to be taught to-day as given in the Weekly Lesson Guide?'
- 'How many messages were imparted?'
- 'How many participants were not convinced by the message?' (Message-wise.)
- 'What visual aids were shown?'
- 'What were the suggestions made for the modifications of the materials given?'
- 'How many new alphabets were taught?' (Functional Literacy classes.)
- 'How many learnt those new alphabets?'
- 'Did you find that the materials given in the Daily Discussion Guide adequate to answer the questions raised by the participants?'
- 'Did the Health Educators prepare the lessons well in advance before commencing the regular class?'

- 'What demonstration was conducted?'
- 'How many tasted the food that was cooked said that it was tasty and took the food with them for their homes?'
- 'What are the ingredients that are not available locally?'

### Class Attendance

Table I (see Appendix 3) shows that although the planned strength for each centre was 30, the actual enrolment was from 14.7 in FLIT to 28.3 in MCC+FLIT. The attendance in both MCC and MCC+FLIT centres was at the 50 per cent level of enrolment. In FLIT centres, the attendance was much lower. Perhaps, the Functional Literacy teachers were able to pay a great deal of personal attention to the participants, in view of their very small number.

*Message Content of the Lessons:* The DLS forms gathered information about the number of participants who were not convinced of a message/messages in the lesson. Based on this information, the Project Officers in charge of preparation and revision of materials examined the reasons for the scepticism or the areas that were not convincing. During revision of the material, wherever possible, they were suitably modified.

The percentage of participants who were not convinced of the messages was higher in MCC than in MCC+FLIT during the early part of the programme. During the later part, this was reversed. In general, in MCC and MCC+FLIT the percentage of participants who were not convinced of the messages decreased during the later part of the programme when compared to the earlier part. This may be due to the fact that the materials that were used during the later part were better prepared and presented.

*Visuals:* The percentage of participants who did not show any enthusiasm to look at the visuals was very low. In both MCC and MCC+FLIT about 7 to 8 per cent of the participants did not show any enthusiasm for visuals on nutrition education and pictures on rickets and flash cards on food groups. These visuals obviously needed extensive revision.

### Literacy Components

Table II (see Appendix 3) gives the percentage of respondents who learned the literacy components of Functional Literacy lessons. In



FLIT classes flash cards, word buildings, picture-association cards were used.

### **Nutrition Demonstration**

Twenty-five Nutrition Demonstrations were conducted in all the 12 centres. Time taken for actual demonstration in the classes was the same in all the centres, whereas the time taken for the preparation before starting the demonstration was higher in MCC centres than in the MCC+FLIT centres. All centres reported the number of participants who tasted the food and said that it was tasty. Table III (see Appendix 3) provides the data.

There was little difference between the percentage of those who tasted the food and those who said that it was tasty. This meant that most of the preparations were good. In three centres, i.e., at Elkicherla, Bandarpalle and K. Malkapur, the number of children who attended the centre was the same as that of the participants. In the other 9 centres the number of children was about one-half to three-fourths of the number of adults.

Table IV (see Appendix 3) gives details regarding those participants who took home a small quantity of food to be tasted by members of their families and showed interest in learning the cooking process.

### **Inter-village Variations**

Table V (see Appendix 3) gives the percentage of participants who understood the nutritional value of the food prepared in the nutritional demonstration classes. It will be seen that the percentage of participants who could not totally understand the nutritional value of the foods prepared in the class was negligible. If it could be assumed that the ability of the Health Educators in all the centres was same, the data showed that there was inter-village variation in the acceptance of the items.

In order to examine whether the participants cooked the same food that was demonstrated in the classes or modified their traditional methods of cooking in the light of the demonstrations, the Health Educators collected some relevant data and reported through the DLS forms. Table VI (see Appendix 3) gives the details. It will be seen from the table that except for three villages, the percentage who cooked the same foods at their homes was very small. Almost the same

proportion reported that the method of cooking worked out well. As one would expect, some of the participants who tried it did not like the taste. An effort was made by the Project Officer to enquire into the reasons so that the recipes could be suitably modified.

### **'No Time to Cook'**

In order to understand why some participants did not cook a food that was demonstrated in the classes, the Health Educators collected data through the DLS form. Table VII (see Appendix 3) gives the reasons as reported to the Health Educators. Most of the respondents reported that they could not find the time to cook the food items. Lack of financial resources and objections from mothers-in-law were the other two reasons cited frequently.

For improving the quality and content of the lessons prepared for the rural women, the experts who prepared the lessons and those who were charged with revision were supplied with feedback information collected through DLS forms. A report based on these forms was prepared every fortnight. The project officials made use of these reports when they had to revise teaching materials. A summary of those reports has been presented above. In addition to substantive interests and immediate benefits accruing to the programme, the feedback system demonstrated that the teachers could be used effectively to collect data relevant for the revision of teaching materials.



### APPENDIX 3

TABLE I: Fortnightly average attendance (per centre) by experimental treatments (Phase II)

S.No.	Period		Average attendance per centre		
	From	To	FLIT centres	MCC centres	MCC+FLIT centres
1.	May 20	June 15	4.00	12.3	14.5
2.	June 17	July 13	3.00	15.1	16.5
3.	July 15	July 30	3.5	16.5	18.2
4.	Aug. 1	Aug. 17	3.9	15.1	16.7
5.	Aug. 19	Sept. 30	3.9	13.9	16.0
6.	Oct. 1	Oct. 31	3.1	10.2	9.0
7.	Nov. 1	Nov. 16	2.9	8.9	11.1
8.	Nov. 18	Nov. 29	3.6	12.0	14.7
9.	Dec. 2	Dec. 14	2.3	10.6	11.4
10.	Dec. 16	Dec. 31	3.2	12.0	14.6
11.	Jan. 1	Jan. 18	2.7	9.9	13.3
12.	Jan. 20	Feb. 15	3.0	10.8	13.0
Total enrolment			14.7	23.1	28.3

TABLE II: Per cent participants not convinced of the messages in the non-formal education classes by experimental treatments (Phase II)

S. No.	Period		Lesson units taught (chapter-wise units)	Per cent participants not convinced		
	From	To		FLIT centres	MCC centres	MCC+FLIT centres
1.	May 20th to		Practice lessons	0.0	8.2	2.2
	June 15th		1-12 and 1-1 to 1-12	(0)	(139)	(40)
2.	June 17th to		1-13 to 1-20	0.0	11.3	6.5
	July 13th			(0)	(235)	(148)
3.	July 15th to		1-21 to 1-22 and	0.0	10.4	6.3
	July 30th		revision lessons 1-10	(0)	(145)	(91)
4.	August 1st to		Nutrition units 1-8	0.0	11.4	7.0
	August 17th			(0)	(81)	(56)
5.	August 19th to		9 to 22	0.0	5.6	7.6
	September 30th			(0)	(85)	(129)
6.	October 1st to		23 to 30 (two revised)	0.0	4.7	8.8
	October 31st			(0)	(23)	(48)
7.	November 1st to		4-1 to 4-12	0.0	3.2	8.2
	November 16th			(0)	(20)	(29)
8.	November 18th to		4-13 to 4-14 and	1.3	2.7	8.5
	November 29th		5-1 to 5-9	(1)	(20)	(29)
9.	December 2nd to		5-10 to 5-20 and	0.0	1.3	5.9
	December 14th		6-1 to 6-2	(0)	(9)	(27)
10.	December 16th to		6-3 to 6-4 and	5.8	3.1	6.8
	December 31st		7-1 to 7-5	(3)	(18)	(30)
11.	January 1st to		7-6 to 7-17	0.0	0.3	0.9
	January 18th			(0)	(2)	(5)
12.	January 20th to		7-18 to 7-29 and	0.0	0.2	0.5
	February 15th		revised lessons 1 to 6	(0)	(2)	(3)



TABLE III: Per cent participants who did not show any enthusiasm to look at the visuals by experimental treatments (Phase II)

S. No.	Period		Visual aids shown	Per cent participants not shown enthusiasm		
	From	To		FLIT centres	MCC centres	MCC+ FLIT centres
1.	May 20th to		Birth Atlas, Photo	0.0	2.4	0.2
	June 13th		XMH-2, Kamal Katha	(0)	(41)	(4)
2.	June 15th to		Birth Atlas, PNU-4	0.0	1.3	1.6
	July 13th			(0)	(27)	(31)
3.	July 15th to		Birth Atlas, PNU-5	0.0	1.4	3.0
	July 30th		Cotton samples	(0)	(20)	(44)
			XCC-6 (Photo)			
4.	August 1st to		PCD-2, PNU-5, PNU-6	0.0	2.1	7.6
	August 17th		and PNU-11	(0)	(15)	(61)
5.	August 19th to		PNU-17, PCD-Flannel	0.0	2.2	3.0
	September 30th		strips, PNU-7, 11, 4,	(0)	(34)	(49)
			10. Feeding of the Baby			
			Kistamma Katha, Story			
			type pictures. Baby weight			
			and development, supple-			
			mentary feeding methods			
6.	October 1st to		Photos -XNU-10, 11,	0.0	7.1	8.0
	October 31st		13, 12, 15 and 14,	(0)	(35)	(44)
			pictures on ric-			
			kets, flannel strips			
7.	November 1st to		PCD-5, XCC-17	0.0	1.6	2.3
	November 16th		(1-7) PCI-6, 10, 12,	(0)	(10)	(8)
			PCD-2, PSPH-1 to 13			
8.	November 18th to		Leaflets, PCI-2,	0.0	0.4	1.9
	November 29th		9, 11, 13, 14,	(0)	(3)	(10)
			XCC-21 (Photo)			
			PCI-1, PNU-15			
9.	December 2nd to		PCI-13, 5.	0.0	0.0	0.0
	December 14th			(0)	(0)	(0)
10.	December 16th to		PFP-3, 4, 9, 10 Calen-	0.0	1.2	1.6
	December 31st		dars. Model of a	(0)	(7)	(7)
			smokeless chula,			
			child development charts			
11.	January 1st to		PGK-1 to 11	0.0	0.3	0.9
	January 18th			(0)	(2)	(5)
12.	January 20th to		Maps of State, Dist.,	0.0	0.0	2.2
	February 15th		Charts of Rail journey,	(0)	(0)	(14)
			Working of a Post Office.			

TABLE IV: Per cent participants who learned the literacy components by experimental treatments (Phase II)

S. No.	Period		Per cent participants learned the literacy components		
	From	To	FLIT centres	MCC+FLIT centres	Total
1.	May 20th to	July 30th	NA	NA	NA
2.	August 1st to	August 17th	100.0 (166)	47.6 (505)	54.8 (671)
3.	August 19th to	September 13th	100.0 (337)	72.9 (1904)	76.0 (2241)
4.	October 14th to	October 31st	100.0 (53)	53.3 (128)	61.8 (181)
5.	November 2nd to	November 16th	98.7 (76)	51.3 (162)	60.5 (238)
6.	November 18th to	November 29th	100.0 (55)	56.2 (140)	64.1 (195)
7.	December 2nd to	December 14th	66.6 (4)	40.0 (78)	31.8 (82)
8.	December 16th to	December 31st	98.4 (45)	52.0 (52)	66.0 (97)
9.	January 1st to	January 18th	98.0 (46)	63.2 (48)	76.4 (94)
10.	January 20th to	February 15th	92.6 (25)	48.1 (63)	55.7 (88)

Note: NA - Not Applicable as the lessons were revision lessons only.



TABLE V: Per cent participants who tasted the food items prepared in the demonstration classes and said that they were tasty (Phase II)

S. No.	Name of centre	No. of participants*	Per cent of participants			
			Tasted	Said tasted good	No. of children	Tasted
A. MCC Centres						
1.	Md. Hussainpalle	376	92.8	90.4	181	64.6
2.	Nizalpur	437	86.3	78.0	82	69.5
3.	Elkicherla	357	86.2	86.2	314	100.0
4.	Maddigatla	223	100.0	91.0	180	100.0
5.	Gurakonda	232	84.9	71.6	196	97.0
6.	Bandarpalle	318	85.8	87.4	244	76.2
B. MCC+FLIT Centres						
1.	Kotha Molgara	433	93.1	93.5	164	31.9
2.	Patha Molgara	307	92.5	84.7	100	100.0
3.	K. Malkapur	429	85.3	78.8	365	47.9
4.	Parpalle	278	85.5	84.7	142	76.8
5.	Polkampalle	356	96.6	82.9	156	96.2
6.	Tadikonda	273	93.8	89.4	23	100.0

\*Sum of those who attended the classes in all the days for which DLS data were available.

TABLE VI: Per cent of participants who took the preparation to their homes, showed interest in learning the preparation, said they would try it at home and believed that it was having nutritional value — by centres (Phase II)

S. No.	Name of centre	Per cent participants				Total*
		Took the prepara- tion to their homes	Showed interest in learn- ing	Said they would try it	Believed it had nutri- tional value	
A.	<i>MCC Centres</i>					
1.	Md. Hussainpalle	73.7	72.3	44.7	88.3	100.0 (376)
2.	Nizalpur	16.9	81.5	51.0	100.0	100.0 (437)
3.	Elkicherla	63.0	69.2	52.0	89.0	100.0 (357)
4.	Maddigatla	53.4	85.2	63.2	82.5	100.0 (223)
5.	Gurakonda	61.2	68.1	46.6	62.5	100.0 (232)
6.	Bandarpalle	74.8	69.8	37.0	84.9	100.0 (318)
B.	<i>MCC+FLIT Centres</i>					
1.	Kotha Molgara	22.4	21.7	18.9	92.1	100.0 (433)
2.	Patha Molgara	24.1	31.3	21.2	75.6	100.0 (307)
3.	K. Malkapur	31.5	58.7	29.8	69.2	100.0 (429)
4.	Parpalle	31.3	43.6	24.4	76.4	100.0 (278)
5.	Polkampalle	3.0	24.2	16.0	64.3	100.0 (356)
6.	Tadikonda	19.0	62.2	45.4	69.6	100.0 (273)

\*Sum of all those who attended the classes in all the days for which DLS data were available.



TABLE VII: Reported level of understanding of the nutritional values of the foods that were prepared in the nutritional demonstration classes (Phase II)

S. No.	Name of centre	Per cent of participants who understood the nutritional value of these preparations			Total*
		Fully	Partly	Not at all	
A.	<i>MCC Centres</i>				
1.	Md. Hussainpalle	85.1	14.6	0.3	100.0 (376)
2.	Nizalpur	83.8	14.2	2.1	100.0 (437)
3.	Elkicherla	82.2	13.0	0.0	100.0 (357)
4.	Maddigatla	70.8	27.8	1.3	100.0 (223)
5.	Gurakonda	60.7	28.9	10.3	100.0 (232)
6.	Bandarpalle	79.2	13.5	7.2	100.0 (318)
B.	<i>MCC+FLIT Centres</i>				
1.	Kotha Molgara	60.0	36.7	3.2	100.0 (433)
2.	Patha Molgara	57.7	25.4	16.9	100.0 (307)
3.	K. Malkapur	48.5	31.0	17.2	100.0 (429)
4.	Parpalle	35.3	36.4	22.9	100.0 (278)
5.	Polkampalle	77.0	13.8	9.3	100.0 (356)
6.	Tadikonda	57.5	31.5	1.8	100.0 (273)

\*Sum of all those who attended the centre in all the days for which DLS data were available.

TABLE VIII: Per cent of participants who cooked nutrition demonstration food items at home and those who said they were tasty (Phase II)

S. No.	Name of centre	No. of participants	Per cent participants		
			Cooked at home	Said had worked out well	Said it was tasty
A. MCC Centres					
1.	Md. Hussainpalle	376	4.8	4.8	4.8
2.	Nizalpur	437	4.3	3.0	0.2
3.	Elkicherla	357	50.3	48.9	42.1
4.	Maddigatla	223	52.0	34.5	22.9
5.	Gurakonda	232	34.1	26.7	31.0
6.	Bandarpalle	318	6.9	6.9	0.9
B. MCC+FLIT Centres					
1.	Kotha Molgara	433	6.7	6.7	5.3
2.	Patha Molgara	307	8.5	8.5	7.8
3.	K. Malkapur	429	15.6	15.6	14.7
4.	Parpalle	278	7.6	7.6	0.0
5.	Polkampalle	356	7.6	7.6	1.7
6.	Tadikonda	373	13.9	13.9	10.6

TABLE IX: Reasons for not cooking the food items that were demonstrated in the nutrition education classes — by type of experimental treatments (Phase II)

S.No.	Reasons for not cooking the food item	Experimental treatments	
		MCC	MCC+FLIT
1.	Lack of leisure	140	80
2.	Lack of money	111	103
3.	Objections from mother-in-law, husband	31	15
4.	Gave excuse as: Will cook tomorrow, will cook after harvest, etc.	50	79
5.	Not interested as it smells differently	21	15
6.	Food items not available	12	16
7.	Too many people in the family	2	7
8.	Forgot how to cook	0	5
9.	NA/DK	3	5

NA - Not applicable

DK - Don't Know



## CHAPTER VI

# FUNCTIONAL LITERACY TEACHING MATERIALS AND SUPPLEMENTARY READERS

**M.L. Rao & T.A. Koshy**

The 18 Card Sets — Synthesis — Revision of F.L. Teaching Materials  
— The Screening — New Cards — Final Revision of Phase II Materials.

### *Abstract*

The methodology of teaching under the Functional Literacy Programme with special reference to maternity and child health problems is explained.

THE ROLE OF textbooks in formal education is being substituted effectively by the use of card sets in the Functional Literacy Programmes. A Workshop on the Functional Literacy Teaching Materials prepared 18 such card sets. Each set consisted of five to seven cards, covering a single topic. Each set unfolded a complete story.

### **The 18 Card Sets**

The Card Sets were built around the following topics:

1. Need for regular check-ups during pregnancy.
2. Motivation for going for regular check-ups.
3. Where, when and why of check-up?
4. What they do at the MCC?
5. Recognition of abnormalities in pregnancy and remedial measures.
6. 4th, 5th and 6th months of pregnancy.
7. Specific abnormalities such as swelling, eye disease, fits; Constriction of stomach and yellow discolouration of urine.

8. Consequences of abnormality in pregnancy and its effect on mother and child.
9. Under-nourishment and its consequences on pregnancy and child.
10. Difficulties of labour and precautions to be taken; Change of position in the womb.
11. Under-nourishment and its effects.
12. Safe delivery:
  - How to arrange for confinement at home: Preparing the room for delivery.
  - Consequences of delayed delivery.
13. Infection in the new born infant – general.
  - Eye diseases and skin disease.
  - Diarrhoea.
  - Jaundice and breast enlargement.
14. Feeding the infant.
15. Supplementary foods.
16. Iron deficiency and supplemental foods.
17. Keeping cost of family foods low.
18. High toddlers' mortality rate.

Every lesson is introduced by the teacher in the form of a story. Here, the story begins with a young woman named Kamala in her first pregnancy. The first card has a photograph of Kamala with a short caption in Telugu which says KAMALA CHULALU (Kamala is Pregnant). The photograph gives the teacher an opportunity to talk about pregnancy of young women and the care that needs to be taken in respect of first pregnancy. The two words KAMALA CHULALU are then analysed into their letter units as 'KA', 'MA', 'LA', 'CHU', 'LA' and 'LU' and the learners are taught the method of writing and pronouncing each letter.

### **Synthesis**

Then, synthesis of the above letters to form new words and their pronunciation are taught. Each set of five to seven cards had the following sequence:

Words, analysis into letters,  
 fixation by reading,  
 fixation by writing,  
 synthesis of new words by combinations.



Thus in card 1-2, the key words were analysed into their component letters and then the letters were synthesised to form new words using only the letters learnt from the key words and card 1-1. In card 1-3 short sentences of two or three words using the letters already learnt were introduced. In card 1-4 the symbols for vowels (*matras*) were introduced along with instruction on how to join them on to consonants. Card 1-5 had words already learnt but with one or more letters missing and the learners were expected to fill in the missing letters to complete the words. Card 1-6 contained instruction on writing each letter; strokes generally followed in Telugu-writing were shown with dotted lines over which the learner could write. Card 1-7 was for writing exercise with the words learnt at the top in large-size letters with eight lines below for copying. The same pattern was followed in all the 18 sets except that in later sets longer sentences were introduced.

### Revision of F.L. Teaching Materials

The teaching material for Functional Literacy consisting of 18 card sets, was entitled *Mata Sisu Samkshema Saksharata* (Mother Child Welfare Literacy). The cards were punched on the left to make a loose-leaf notebook so that participants can build up the 'book' as they learn each day's lesson. Revision of this material began almost simultaneously with the starting of the Functional Literacy Courses in Phase I in July 1973 although the feedback system was put into effect only in February 1974. Until then, the source of information on the use of materials was the periodic reports by teachers and observations by the Supervisors and the Project Officer (Literacy). On the basis of such information, the Project Officer (Literacy) proposed the revision to be made and it was discussed with the Consultant on Materials before a decision was made.

### The Screening

An illustration of the above procedures is given below:

#### CARD 1-1

##### *Item 1. Illustration on the card:*

Summary of Teachers' reports and observations by	Photograph of Kamala. In four villages (Phase I) most of the
--	--

Supervisors and Project Officer (Literacy):

participants identified the photograph as that of a village girl of about 14 or 15 years of age and who is pregnant. In the lesson it is mentioned that Kamala is about 16 years old. The idea in the photograph was to show pregnancy at a young age and that was achieved. Hence the photograph need not be changed.

Comments by the Project Officer (Literacy) and suggested revision, if any:

Suggestion accepted – no change.

Comments by the Consultant on Materials:

### *Item 2. Caption – Kamala Chulalu*

Summary of Teachers' reports and observations by Supervisors and Project Officer (Literacy):

None of the participants used the word CHULALU to refer to pregnancy. Instead, they used words like Garbini, Nindumanisi, Nilluposukunnnanu and Kaduputhonunnnanu.

Comments by Project Officer (Literacy) and suggested revision:

As the word 'Chulalu' is not used in Telengana area, this word should be changed. Among the other words used, Nindumanisi is simple and more expressive of the condition of Kamala and hence the word 'Chulalu' should be replaced by Nindumanisi in the caption. Although Garbini is a shorter word, Nindumanisi is preferable and therefore it is accepted.

Comments by the Consultant on Materials:

### **New Cards**

In this manner information was collected on the effectiveness of illustrations, and the intelligibility of captions and the words formed with the letters on all the cards. Appropriate revision was made on the basis of field reports. The first few sets of cards of Phase I were revised substantially introducing new captions with words more familiar to



the people in the area. For introducing numerals, pictures were introduced. Addition and subtraction were also introduced through pictures. The revised material for Phase II contained several new cards which were helpful in increasing the discriminating capacity of the participants in order to sustain their interest. The following new cards were introduced in Phase II:

- Reading of sets of letters identifying the similarities in them.
- Reading of similar letters in given pairs of words.
- Identifying similarities and differences in given pairs of words.
- Identifying the similarities in given double consonant letters and recapitulation and writing of words using those double consonants.
- Pairs of words in which one letter in each looks almost similar and one may confuse one for the other. The participants were asked to recognise the differences and identify the letters.

### **Final Revision of Phase II Materials**

Using the feedback information collected during Phase II action programme, Phase II materials were further revised. The other source of information for revision were the diaries maintained by Teachers/Health Educators on Functional Literacy teaching and the observations of the Project Officer (Literacy). In addition to changing some words which were not in vogue and not understood easily, a few words were removed from card sets 5, 6, 7, 9 and 10 mainly to reduce the load. It was observed by the Project Officer (Literacy) that these cards could not be finished during the class time. The Consultant also agreed that the contents of these lessons should be reduced.

In the Phase II materials, no exercises were originally included involving addition and subtraction of two digits and three digits. But it was found later that the use of two digits and three digits was very common and frequent in the day-to-day life of the participants. Hence, in the revised Phase II materials, two cards were added incorporating exercises on two and three digits.

## CHAPTER VII

# NON-FORMAL EDUCATION MATERIALS AND THEIR REVISION

**Hari Adishesuvu**

Discussion Guide in Telugu — Visual Aids: Testing Photographs — Other Visuals — Visual Support — Discussion Session — Revision of Materials in Phase II — Guidelines for Revision.

### *Abstract*

Many novel educational aids had to be evolved, tested and revised during the progress of the action programme. This chapter gives details of these and the 100 Non-formal Education Lessons taught during Phase II.

EDUCATIONAL MATERIALS HAD to be prepared for those who teach as well as for adults who are exposed to literacy for the first time in their lives. It was indeed not difficult to produce the teaching materials for the instructors. But the 'Learning tools' for the participants had to be designed, tested and evaluated with great care in the form of posters, photographs, models and written lessons. Conventional textbooks and urban-oriented posters and photographs could have no relevance in carrying the message of this programme to the intended participants. The entire success of the programme depended on this single problem of intelligibility and suitability of the visual material on which discussion could be initiated between the teacher and the taught.

### **Discussion Guide in Telugu**

A Discussion Guide in Telugu entitled Mother Child Welfare Education (*Mata Sisu Samkshema Vidya*) was prepared in the Workshop for use in Non-formal Education classes by Health Educators. It was designed to help them and the women participants during the discussion period of about 45 minutes. Subjects dealt with



in this Guide included:

- need for a pregnant woman to have a medical check-up;
- nutritional requirements of a pregnant and lactating woman;
- nutrition of the infant and the toddler.

In addition to the Discussion Guide, the Health Educators (Auxiliary Nurse Midwives) who were the teachers of Non-formal Education in Mother Child Centres were given the following materials:

(i) *Teaching Material for Non-formal Education (in Telugu)*: This was intended to be a source book of information on the subject matter. It contained 47 lessons classified under eight chapters, covering 18 topics of the course content.

(ii) *Food and Health (in Telugu)*: This was a publication of the National Institute of Nutrition, Hyderabad, and was meant to be used by the Health Educators as reference material.

(iii) *A Manual of Nutrition for Auxiliary Nurse Midwives*: This was a handbook for use in the training of ANMS.

## Visual Aids

Owing to the absence of electricity in most of the villages selected for project operation and the high cost of projectors and other audio-visual equipment, it was decided that only manually operated visual aids would be used in non-formal education and functional literacy classes. Accordingly, prior to the holding of the Workshop for preparation of materials, one set of visuals, mainly charts and posters, already available in the country from various sources, were collected and displayed in the Workshop. We had, indeed, a large stock of posters, but none of these had been sent into the field for testing. The Consultant started sending the suitable ones into the field along with the lesson units and then she personally supervised the classes to determine the communication value of the posters.

The visuals performed two distinct functions: (1) Lending colour to the drab class-rooms as well as arousing the interest of the participants; (2) Helping specifically in introducing a topic for discussion. As the posters were not prepared specially for the project, they performed the first function more effectively than the second. With the help of a Consultant on visual aids for non-formal education, these were reviewed in the light of the course content. On the basis of

this assessment, the visuals were selected for use in Phase I.

In addition to the posters and charts (see Appendix 4 for list of teaching aids for use in non-formal education and functional literacy), the book *Birth Atlas*, several photographs and selected illustrations designed in the Workshop were also used in the project. The Consultant, who was specially appointed for testing and evaluation of materials, worked with the Project Officers at Mahbubnagar and designed a procedure for testing the photographs.

*Testing Photographs:* About 20 photographs were tested. The investigators visited the villages and randomly selected 10 women to test the effectiveness of the photographs, using the following procedure. They were to show one photograph at a time to one respondent and then ask the question: 'What do you see in this photograph?' The reply was recorded verbatim.

In respect of some visuals, identification by the respondent will be simple and direct as in the case of the picture of a baby being given a bath. Here, the job is done without further questioning. But with certain other photographs, identification may not be easy. For example, in photograph No. 5, a likely answer might be 'picture of a woman holding a girl'. Then the question would be: 'Does the child look normal?' If the answer is 'Yes', the answer is recorded. If the answer is 'No', the next question would be: 'What do you think is the matter with the child?'

The information received in Telugu was then translated into English and the content analysed. If out of ten respondents, 7-9 identified the picture correctly, it was decided that the photograph concerned could be used. On the basis of this, 10-12 photographs were selected. Later, during Phase II, a photographer was commissioned to take 6 sets of photographs, each set containing 6-10 pieces. Considerable amount of time was spent in planning the kinds of photographs needed for easy assimilation. A number of these were mounted on card board for use in the classes.

### **Other Visuals**

As the visuals started going into the field, there was a demand for more. Flip charts obtained from Lucknow were given to the teachers with very clear instructions on the manner in which to use them. Later classes were personally supervised by the Consultant in order to determine the effectiveness of the flip charts. Some skepticism had



been expressed regarding the effectiveness of a flip chart on 'the importance of weaning foods'. It was said that in differences the locals and dress patterns would cause an interference in the understanding of the visual. It was further suggested that the flip chart should be adapted to suit the local scene. The suggestion was valid but for lack of artistic talent in Hyderabad, no solution appeared to be in sight. Therefore, it was decided to test them and the flip charts were sent into the field.

The teacher was asked to flip it once over without saying anything. As she did so, the remarks of participants included comments on the colour of the clothes, the manner in which the women were dressed, etc. When the teacher flipped it over the second time, the extraneous details were forgotten and the women started noticing the main point of the flip chart, namely, the difference between a weaned child and a breast-fed child. The third time over, the message of the flip chart was stated by the participants in very clear and definite terms.

This pattern of responses was followed in all the Mother Child Centres. The visuals thus tested in a classroom situation were posters, flip charts, flannel-graphs, sketches, drawings and models. In view of the enthusiastic response of the participants, some more visuals were developed and used so as to provide the participants stimulating and interesting sessions.

### **Visual Support**

For visual support of lesson units on "Food Beliefs" (hot, cold food, etc.), small packets containing a small quantity of pulses and cereals or small pieces of fruits and vegetables which the participants considered harmful for pregnant or lactating mothers were put on display. Later, the women built a flannel-graph with the 'food packets' that had been supplied to the centres. The participant response to this method was encouraging; for at least some, the identification of some of the taboo foods had not been very clear earlier.

The use of the materials prepared for non-formal education in Phase I and their revision began almost simultaneously when action programme began in July 1973 and continued up to April 1974. Forty-five lesson units covering the following subject areas in the course content were prepared: Health Care of Toddler; Child Development and Rearing Practices; Responsible Parenthood; General Knowledge; and Civics and Citizenship. These units were

tried out in the field and were found to be quite effective. The visual aids collected or improvised locally were used along with these lessons. It was felt that the visuals were insufficient in number. The number was increased in Phase II.

### **Discussion Session**

The field observations made during this period, though meagre and limited, were enough to show that 30 to 40 minutes was optimal time for a discussion session. In the light of these observations, the lessons prepared for use in Phase I during February and March 1974 required considerable pruning.

Further the language used in writing the lessons, though simple and in spoken form, did not conform to the local dialect. Consequently, further simplification of the language used in the lesson units became necessary. There was a noticeable reluctance to discuss the subject of Family Planning and this was reflected in the lack of enthusiasm among the women even to hear a story related by the instructor.

### **Revision of Materials in Phase II**

During Phase II, 100 Non-formal Education lessons were taught, covering the following five subject areas of the course content:

1. Maternal and Health Care for a Healthy Baby;
2. Child Development and Rearing Practices;
3. Health Care of Infants and Toddlers;
4. Responsible Parenthood; and
5. General Knowledge which includes services available through Government Departments and Citizenship rights.

Out of the 100 lessons, the Project Officer (Materials) supervised forty-five of them during his inspection visits to the centres. His personal observations made during the 69 inspection visits enabled him to gather information relating to: (i) the capacity of the participants to receive, assimilate and use the knowledge gained by them through the lessons; (ii) the inherent handicaps which arise on account of the social and economic conditions in which the participants live; and (iii) the capacity shown by the Health Educators/Literacy Teachers to understand the information contained in the lessons and the grasp they exhibited during the transmission of



messages conveyed by the materials. These three important considerations helped greatly in deciding the scope and magnitude of the quantum of knowledge, the essential practices that should be chosen for transmission through these materials and the methodology that should be adopted for the purpose.

It was realised that the capacity of the participants to understand, assimilate and practise the knowledge gained was very much limited and conditioned by their traditional beliefs and the poverty in which they were steeped and by their philosophy of life. These field observations suggested that the lessons should not be loaded with information of purely academic importance. On the other hand, it was realised that they would be very well received if a few practical and practicable suggestions only were given as messages in the lessons.

### **Guidelines for Revision**

Feedback reports also provided some useful information to rationalise the revision of materials. On the basis of 12 feedback reports received in Phase II, materials including visuals were revised. Materials were also revised on the basis of tests conducted to determine the amount of information gained and retained by the participants. The number of participants answering a question correctly was taken roughly as an index of the degree of acceptance of the message. The information was used in improving some of the lessons.

Similarly, the answers given by 141 participants from 12 centres in the final assessment conducted in February 1975, after all the subject areas had been covered, were also analysed. The results indicated that 17 messages required increased emphasis while 12 could be retained as they were and that addition of two new items in the lessons was required.

In the course of the final revision of the lessons used in the Non-formal Education Project due consideration was given to the level and intelligibility of the language used and the methodology followed in the lessons. Source materials used in Phase I were revised for use in the preparation of lessons for Phase II. Source material on Child Development and Rearing Practices was prepared by the Professor of Child Development, College of Home Sciences, Hyderabad, and this was modified by the Project Officer (Materials) to suit the local conditions. Source material on General Knowledge and information about services were obtained from the publications of the Andhra

Pradesh Information Department, Agricultural Department and the Agricultural University.

Every care was taken to use simple, non-academic but idiomatic Telugu in the particular local dialect as the medium. Screening and revision was adopted as a continuing process throughout Phase I and Phase II.



#### APPENDIX 4

List of Teaching Aids for Use in Non-formal Education and Functional Literacy  
Posters/Charts

S. No.	Title/Subject	Language	Code No.
1.	Poshaka Padartamulu (Nutritious food)	T	PNU-1
2.	For Good Health	E/T	PNU-2
3.	Vitamins for Bright Eyes	E/T	PNU-3
4.	Health habits among school children	E/T	PNU-4
5.	Feeding chart for babies (Birth-12 months)	E	PNU-7
6.	Summer vegetables (for North India)	E	PNU-8
7.	Breast Milk Best for Infants	E	PNU-10
8.	Objectives of Nutrition Education – Basti and Gorakhpur	E	PNU-12
9.	Child Welfare	E	PCD-13
10.	Fly spreads disease	E	PCI-1
11.	Prevent Diptheria and Whooping cough by timely Inoculation	E	PCI-2
12.	Fagalame Nirmutunchi Vyadalamu Chakapadu-Konandi (Spreading of diseases by flies – Prevention and Care)	T	PCI-3
13.	Don't gamble with your Life (BCG Vaccination)	E	PCI-4
14.	Fly Spreads Disease	E	PCI-5
15.	Cholera is spread by the contamination of drinking water— —	E/H	PCI-7
16.	Help fight small-pox – take vaccination	E	PCI-8
17.	Help fight small-pox – take vaccination	T	PCI-9
18.	Frequent watery motions may be cholera	E	PCI-12
19.	BCG Vaccination	E/T	PCI-13
20.	Expected Population Growth	E	PP-1
21.	Acres per head of Population	E	PP-2
22.	Peruguthunna Janabha (Growing Population)	T	PP-4
23.	Pillalu Koddimandi Ithe Manchi Vidyavakasalu (Facilities for Education if children are few)	T	PFP-1
24.	Sthila Roopa Rekkalaki Aroghoniki (Spacing of children)	T	PFP-3
25.	Beeda Vallu Goppa Vallu Kavalante (If the poor want to become rich – adopt Family Planning)	T	PFP-4
26.	Pedda Kutumbam Sukha Jeevananiki Sudigali (Large family a hindrance for a happy life)	T	PFP-5
27.	Sukha Jeevana Sophana Patam (Snake and Ladder game on Family Planning)	T	PFP-6

Key: E – English; T – Telugu; H – Hindi. PN – Nutrition; PCI – Communicable Illness; PP – Population; FP – Family Planning.

## CHAPTER VIII

# NUTRITION EDUCATION MATERIALS AND THEIR REVISION

**K. Chittemma Rao**

Material Development — Unitisation: Lesson Unit — Discussion Guide: Meaningful Dialogue — Visual Aids for Nutrition Education: Evaluation of Visual Aids — Food Demonstration: The Objective; Equipment for Food Demonstration — Revision of Materials: Revision of Nutrition Lesson Units; Feedback Reports; Personal Visits; Tape-Recording of Discussions; Tests with Open-ended Questions; Mid-term Evaluation of Material by Educators and Supervisors; Language Revision; Discussions with Field Workers on Reasons for Message Objections; Discussions with Project Staff on Relevance of Nutrition Messages — Revision of Food Demonstration Plan.

### *Abstract*

Nutrition education formed an important part of the non-formal education in MCC's as well as in Functional Literacy centres. An entire section of the course content was devoted to nutritional requirements of the expectant and nursing mother and another section on nutritional care of infant, toddler and child. This chapter gives a detailed account of the preparation, field trial and revision of nutrition education materials.

THROUGH SURVEYS, PERSONAL visits, recorded interviews and group discussions, a great deal of specific information was gathered on the following points: the characteristics of the target population and their socio-economic status; the living conditions, the physiological and nutritional status of the target population and their children below three years of age; the major nutritional problems of the group and their daily activities. Their food beliefs and habits, agricultural practices, locally available foods, the common dietary items, cooking practices, and infant feeding practices were also gleaned from different sources.



## Material Development

In conformity with main focus of the project, the emphasis on nutrition education was on the vulnerable group from whom the participants were selected for the project. The aim was to make the selected mothers aware of the nutritional problems and to teach them how to improve their nutritional status within their means. The main areas covered were:

1. functions of food and its relation to health;
2. dietary habits with special emphasis on the dietary restrictions during pregnancy, lactation and early childhood;
3. prevention of loss of nutrients in the process of cooking;
4. food spoilage;
5. some of the common nutritional deficiency diseases observed among women of child-bearing age in the area and their causes;
6. dietary requirements during pregnancy and lactation;
7. the infant feeding practices;
8. nutritional problems among pre-school children in the area, symptoms, causes and practical ways of prevention of these deficiencies within the limited resources available to them.

In a Workshop held at Hyderabad by the Council for Social Development in 1972, it was decided that the problem to be discussed in the non-formal education class would be posed through a visual depicting the problem. It was also decided to provide a Discussion Guide with some of the suggested questions and the expected answers to the Educator.

## Unitisation

Unitisation was done, keeping in mind the importance of topic, area coverage, level of abstraction needed in the material, size of the class, physical facilities available in the class, attention span of the learners, ability of the learners to think abstractly and the ability of the teachers to understand and communicate the concepts. Each nutrition unit consisted of a lesson unit and a Discussion Guide.

*Lesson Unit:* The lesson unit was meant to be the resource material for the Educators, whose background in the field of Nutrition was limited. The lesson unit comprised the area to be covered, that is, the content with the rationale and the background information, the

instructional methodology and other relevant details. The material was written in simple language and in some detail to suit the level of understanding of the Educators and the women participants.

The lesson unit initially consisted of five major areas. These were:

- (i) the content (C) to be communicated to the target group;
- (ii) the key questions (Q) to be raised in the discussion;
- (iii) the expected answers (A);
- (iv) a note (N) to the Educator;
- (v) the review (R) of the previous lesson or lessons.

The foods mentioned in the lesson unit were primarily related to their functions in terms of their contribution to health rather than their nutritive value, which may be beyond the comprehension level of the participants. The lesson unit provided all the background information for conducting the discussion. As the Educators gained experience in making use of the lesson units in conducting discussions in the nutrition education programme, it was felt that the expected answers included in the lesson units were superfluous. So these were omitted from the lesson units at a later stage.

### Discussion Guide

Each nutrition lesson unit was accompanied by a Discussion Guide. Discussion Guides were developed to help the Educators in conducting discussion as a method of teaching. The Discussion Guide had a format with four columns: (1) the content with main messages, (2) questions to be raised, (3) expected answers, and (4) the visuals to be used along with instructions to the Educator on how to prepare and to use, when to use and what to say while using, etc.

The main messages along with the supporting content were given under the column 'the content'. Important messages from the respective lesson units were taken and concretised under this column. These points were summarised to facilitate the Educator in recalling what was given in the lesson along with supporting points to convince the participants. Educators were permitted to refer to the Discussion Guide while conducting the discussion. This was done in order to have uniform coverage in all the centres. The main messages were underlined to make sure that the Educators communicated these messages and that they also emphasised them.

*Meaningful Dialogue:* Under column (2) 'Questions to be



raised', key questions based on the content to be communicated or the problem to be discussed were given. These questions were not meant merely to elicit 'yes' or 'no' or 'don't know' answers but to create the necessary interest in the participants and encourage their active participation. The questions were also meant to assess the participants' knowledge and alertness, their practices and their beliefs. Each question had some rationale behind it and it was expected to involve the participants and make the discussion useful and meaningful. This kind of dialogue was essential to help the participants in developing confidence. A great deal of understanding of the target groups was required to pick up the key questions. Sometimes a question created very good interest and a good discussion followed. To achieve greater involvement of the participants, the Educators were instructed to raise the questions first, listen to the group and only then to give their comment based on the main message or the content. This procedure was stressed to provide the learner an opportunity to be a teacher while being a learner herself.

The third column under the 'expected answers' was intended to prepare the Educator for the discussion. If the Educator was provided with at least some of the expected answers, she would be better prepared to face the situation in the discussion. In order to get an idea of the expected answers, the Consultant had personal contacts with the target groups. Also through discussions and the tests conducted with open-ended questions, expected answers were gathered. These were used in developing the subsequent lesson units as the material development and nutrition education programme was going on simultaneously. In the revision of the Discussion Guide, the expected answers recorded through the above procedures were incorporated.

### **Visual Aids for Nutrition Education**

It is a well-recognised fact that a multi-sensory approach to education is more effective than a single one. The visual aid was intended to act as an initiation for the discussion and also to pose the problem. An attempt was made to include visuals for each discussion. A few visual aids were developed apart from the large number collected from concerned institutions. The visual aids used were posters, charts, flash cards, flannel strips, models, live examples, exhibits, photographs, and flip charts. As the text and the visual aids must be planned and



incorporated together, available visual aids were collected prior to the material development. Most of the Educators in the (non-formal education) project had no earlier training in handling the visuals and they had to be trained. This imposed a limitation on the use of a variety of visuals. So, simple visuals along with details pertaining to the method of their preparation and use were incorporated in the lesson units.

*Evaluation of Visual Aids:* As part of a regular drill, these visuals were evaluated by the teachers who were shown each visual aid and the message sought to be conveyed. They were asked to rate each visual aid on a three-point scale whether the visual aid in question was very useful, moderately useful or not at all useful in communicating the particular message.

### **Food Demonstration**

Demonstration is recognised as one of the effective aids in teaching, particularly of nutrition education. So, 25 recipes selected from the recipes published by the National Institute of Nutrition and a few standardised at the College of Home Science, Andhra Pradesh Agricultural University, Hyderabad, were used for food demonstrations.

Selection of recipes for demonstration was based on the cooking methods in practice in the area, common items in the meals of the target group, availability of foods, time and fuel for any additional inputs, weaning practices, and the simplicity of the preparation. The facilities available for demonstration at the Centres and the time available for demonstration were also considered while planning the demonstrations. The Educators' knowledge and skill in cooking and their ability in giving the food demonstration were also kept in mind while selecting the recipes, as well as writing the demonstration lessons.

*The Objective:* As the main objective of the nutrition education programme was to improve the nutritional status of vulnerable groups of people, the food demonstrations were aimed at improving the diet within their means and preparation of supplementary foods for infants and pre-school children. An attempt was made to make the food demonstrations an integral part of nutrition education so as to reinforce the messages given in the nutrition lessons and relate them to their own situations. Food demonstrations were used as tools to



concretise the instruction and also to make them visualise the feasible and practicable ways of improving the diets. A list of food demonstrations is given in Appendix 7.

Food demonstration plans were prepared by the Consultant and supplied to the Educators. Each plan consisted of five parts: (i) equipment required, (ii) ingredients, (iii) main steps, (iv) special instructions to the Educators, and (v) the main messages to be given along with the demonstration. A model food demonstration plan is given in Appendix 5.

*Equipment for Food Demonstration:* A set of simple cooking equipment was provided to each Health Educator in MCC and FLIT+MCC Centres. The list of equipment supplied is given in Appendix 6. As far as possible, familiar, cheap, easy-to-handle and essential utensils were included.

Each demonstration plan contained a list of equipment required for giving that particular demonstration in order to facilitate the Educator in arranging the demonstration. At the end of the nutrition education programme the Educators were interviewed and asked to rate the usefulness of equipment supplied on a three-point scale: very useful, moderately useful and not at all useful. The serial order of the equipment in the list at Appendix 6 is as per their rating.

To facilitate proper understanding, the measurements in the recipe were given either in proportions or in numbers. The recipe was planned for a group of 25 participants. The Educators were asked to give demonstration using half the proportion of ingredients if average class attendance was less than 15.

Precautions, instructions for preliminary processing, steps to be stressed and alternate foods to be used in case of non-availability of a particular ingredient given in the recipe, were also included in the plan. Instructions regarding preliminary processing were essential because the time available for demonstration was limited particularly in the FLIT+MCCs.

As food demonstrations were used as aids in nutrition education, a few relevant nutrition messages were given along with the plan for each recipe. These messages were also *underlined* with the intention of reminding the Educator of the main objective of the food demonstration. This facilitated reinforcement, uniform coverage and also served the purpose for which it was meant.

## Revision of Materials

*Revision of Nutrition Lesson Units:* Feedback reports, personal observations, tape-recordings of discussions, tests with open-ended questions, mid-term evaluation of materials by Educators and Supervisors were used in on-going revision. These were also considered while writing the subsequent material.

(a) *Feedback Reports:* Feedback reports were used in monitoring the Educators, motivating people and for further material development. Looking into the feedback reports the objections to the nutrition lessons ranged between 5 and 20 per cent except for one nutrition lesson unit 22 'feeding schedule for an infant' to which average objection recorded was 30 per cent. The reasons for this high percentage of objection were reported as:

- greens extract leads to diarrhoea;
- tomato juice leads to 'cold' and 'vatham';
- lack of time available to prepare these special foods for children.

When a high percentage objection for a particular message or messages was recorded, such messages were modified suitably and reinforced through stories, demonstrations and visual aids. The percentage of participants objecting to nutrition messages was very high in the beginning of the nutrition education programme and it was either negligible or nil towards the end. This was a good achievement in terms of changing their attitudes towards nutrition education programme. This was achieved by improving the teaching competence of Educators through simplifying the material and making it more relevant and concrete, and reducing the quantum of the material to be handled in each class. Periodic training and monitoring also played an important part in making the Educators more confident in handling the nutrition education classes as well as in bringing about a change in their attitudes towards nutrition education programme. Feedback reports were of much use in identifying the classes which recorded more resistance to nutrition education messages. It was found that when an Educator was less competent, less confident and less assertive, the objections recorded were higher and therefore such centres received more attention.

(b) *Personal Visits:* Intensive field visits to the classes were made by the Nutrition Consultant who was also in charge of material development for nutrition education. Approximately 75 per cent of the



classes were visited. These visits were meant primarily to assess the ability of Educators in handling the material and conducting the discussions and demonstrations. These visits helped a great deal in collecting the reactions of the group to the messages in gathering first-hand information on the local conditions. A simple pro-forma was developed to record on-the-spot observations. The areas observed were: physical facilities available in the class; Educators' ability in understanding the nutrition lesson as well as messages; the responses of participants; their level of participation in the discussion; number of active participants; evaluation of the visual aids in terms of message transmission; time taken to cover the topic; attention span of participants. Information on local crops and vocabularies was also recorded. These observations helped in developing relevant nutrition education material.

(c) *Tape-Recording of Discussions:* Nearly 50 per cent of the discussions were tape-recorded. Participants enjoyed listening to their taped discussion. These taped discussions could be used in the future in the training programme of Educators as well as in the nutrition education programme as aids. These recorded discussions were analysed later and used in revising the column 'expected answers' in the Discussion Guide. These tapes were also used for understanding and making use of local dialect and expressions.

(d) *Tests with Open-ended Questions:* Two periodic tests and a final test soon after the nutrition education programme were conducted with open-ended questions and the answers were recorded verbatim. These answers were later analysed and arranged along the rating scale. Some answers along the lower part of the scale were taken and considered for the column 'expected answers' in the Discussion Guide. These answers helped in understanding the target group and used extensively in material development and revision.

(e) *Mid-term Evaluation of Material by Educators and Supervisors:* After a month of nutrition teaching programme, a mid-term evaluation of the material was conducted by the Evaluation Officer by interviewing all the Educators and Supervisors. The areas of enquiry were: (i) clarity of nutrition education material; (ii) time required to read and understand the nutrition lesson, discussion and demonstration of the day; (iii) difficulties faced in conducting nutrition classes and demonstration; (iv) usefulness of Discussion Guides and visual aids; (v) their opinion on the expected answers given in the Discussion Guide; (vi) participants' level of interest in food demonstrations; (vii)

attention span of participants. This information helped in developing appropriate nutrition education curriculum by cutting down the lesson content, simplifying and concretising lessons and the demonstrations.

(f) *Language Revision*: Maximum permissible local dialect was brought in through personal observations, tape-recordings and open-ended questions. The Educators were provided with an exhaustive list of foods and asked to give the local names for the same. They were also asked to bring about necessary changes in the dialect in the lesson itself. Periodically, these lessons were collected from all the Educators and Supervisors, and the local vocabulary was tabulated. All this information was of much use in revision. Finally, a qualified person belonging to rural Telengana area and who had experience in conducting functional literacy classes was asked to edit the lessons and Discussion Guides in terms of the local dialect.

(g) *Discussions with Field Workers on Reasons for Message Objections*: The feedback reports of the Project Officer (Evaluation) provided initially only the average figures for objection for each lesson. To have an understanding of reasons for all the messages objected, a list of objected messages was prepared, taking the information from all the DLS-IB forms of the centres. With the help of the list of messages objected unit-wise, a one-day discussion was held with all the Educators and Supervisors and an exhaustive list of reasons for each message objected was prepared. This information was used in the final revision of lessons.

(h) *Discussions with Project Staff on the Relevance of Nutrition Messages*: Each Discussion Guide was provided with 4-5 messages for emphasis. All the messages were listed unit-wise and discussion was conducted with the Project Officers MCC, Materials, Evaluation and the Research Investigators along with some of the Educators and Supervisors (field workers), who had direct contact with the target population of the project. The unitised messages were read to the members and their opinion on deletion, simplification, modification, reinforcement or concretisation, and relevance were recorded.

### Revision of Food Demonstration Plan

To start with, the demonstration plan included the step-by-step method of preparing the recipe as well as the message to be communicated while demonstrating the recipe. First, six demonstrations were outlined on these lines. Later, it was found that



the Educators were not able to coordinate the steps with the relevant information. As a result, they were able neither to emphasise the steps nor to convey the nutrition messages. So the plan was accordingly modified, steps simplified and concretised. At the end of each demonstration plan, one or two appropriate nutrition messages were given and underlined. This facilitated better communication of both the steps and the messages. There was a complaint from the MCC+FLIT centres in the beginning of nutrition education programme that the class time was quite long owing to food demonstration and participants were reluctant to stay till the completion of demonstration. Maximum time available for food demonstration in the MCC+FLIT centres was only 20-30 minutes. So possible ways of cutting down the demonstration time were planned. Simple recipes as well as preliminary processing steps were included in the plan to overcome this problem.

## APPENDIX 5

### Food Demonstration Plan

#### 'Puntikura Thokku'

(Ground paste of Hibiscus Cannabinus)

#### I. *Equipment Required*

1. Stove
2. Match Box
3. Aluminium vessels - 2 with lids
4. Frying Pan (deep frying)
5. Spatula
6. Masala tin
7. Bucket
8. Mug

#### II. *Ingredients*

- Gogu (Hibiscus Cannabinus) leaves -  $\frac{1}{2}$  kg  
Red Chillies -  $\frac{1}{4}$  kg  
Groundnuts or til seeds or bengal gram dal -  $\frac{1}{4}$  kg  
Oil -  $1\frac{1}{8}$  kg  
Fenugreek - two tea spoonfuls  
Bengal gram dal - four tea spoonfuls  
Black gram dal - four tea spoonfuls  
Mustard seeds - four tea spoonfuls } for seasoning  
Onions -  $\frac{1}{4}$  kg  
Salt - to taste  
Garlic - one small pod  
Tamarind - one big lime size  
Curry leaves - a small bunch

#### III. *Main Steps*

1. Clean gogu leaves, wash and keep them in a clean basket to drain off water.
2. Roast groundnuts. Remove skin and keep them aside. If you take til seed or bengal gram dal instead of groundnut, roast them.
3. Keep frying pan on the stove and take half of the oil in the pan. When the oil is hot put red chillies and fry them till they turn brown. Remove chillies, take the chopped onion and fry them to golden brown in the remaining oil. Remove the onion from the pan.
4. Take gogu leaves in the frying pan. (If frying pan is not sufficient take one of the aluminium vessels.) Keep tamarind in the leaves, cover and steam the leaves till they are cooked. (Water should not be added.)
5. Grind red chillies well, roast groundnuts or til seed or bengal gram dal together without any addition of water. Add steamed 'gogu' leaves and grind them slightly.
6. Take the remaining half of the oil in the pan. Add red chillies when the oil is



hot enough, garlic, fenugreek seeds, mustard seeds, bengal gram, black gram dal one after the other after each one is fried to brown and finally add curry leaves. Remove the frying pan from the stove, add the chutney and mix well.

IV. *Special Instruction to the Educator*

Instead of gogu leaves, you can take 'ponnaganti' leaves or tender tamarind leaves or 'chennugaku'. Many other edible leaves can be used to prepare chutneys like this.

V. *Main messages:*

1. It will be nice to make different types of chutneys with the same foods instead of preparing same type of chutney every day.
2. If some dal is added to daily items of meal like this, it is good for the body. Every one at home enjoys variety in a meal.

- Note
1. Demonstrate it in the class if you have a small grinding stone. Otherwise grind the chutney prior to the class, and show the seasoning in the class. But you should stress the quantity of each ingredient taken. Even if there is the slightest possibility to show the preparation in the class, try to demonstrate it in the class.
  2. If the regular class attendance is less than 15, use only half of quantity indicated above and demonstrate.

## APPENDIX 6

### List of Cooking Equipment Supplied to each Centre

<i>S. order of rating</i>	<i>Item</i>	<i>Quantity</i>
1.	Aluminium curry spoons	2
2.	Masala tin	1
3.	Medium size aluminium vessel with lid	1
4.	Small plastic serving plates	30
5.	Plastic mug	1
6.	Stainless steel knife	1
7.	Aluminium water jug	1
8.	Tea spoons	2
9.	Aluminium spatula	1
10.	Frying pan (for deep frying)	1
11.	Mesh cover	1
12.	Vegetable strainer (Plastic)	1
13.	Tongs (Steel)	1
14.	Roller and pin (wooden)	1
15.	Tray	1
16.	Frying pan	1
17.	Soup strainer	1
18.	Big aluminium vessel with lid	1
19.	Aluminium oil can	1
20.	Aluminium vegetable scraper	1



## APPENDIX 7

A List of Food Demonstrations given by Health Educators in Phase II of the Project

<i>S. No. Telugu name</i>	<i>English name</i>
1. Jonnapinditho kichidi	Jowar kichdi (Pudding-like preparation with Jowar)
2. Pappulatho Avirikudumu	Kokla (Cereal-dal mixed cake)
3. Thaidapinditho puttu	Ragi puttu (Ragi flour and sugar mixture)
4. Jonnapinditho rottelu	Jowar roti (Indian bread made of Jowar flour)
5. Ambali	Ambali (Jowar flour gruel)
6. Nuvvupapputho pulihora	Tamarind rice with til seed added
7. Molakethinaginjala	Sprouted grams
8. Balahartho laddu	Balahar laddus
9. Perugesikuru	Avial (A mixed vegetable preparation)
10. Akkukura, tomato kura	Greens with tomato
11. Pappulatho paramannam	Khbir with dals (dal pudding)
12. Pappuginjalatho kura	Curry with whole pulse grains
13. Palakura perugupachadi	Curd chutney with palak
14. Puntikura Thokku	Chutney with Gogu
15. Pasibiddaku palu thayaru chese vidhamu	Preparation of milk for a new-born baby
16. Pasipillalaku tomato	Tomato soup for infants
17. Akukuratho rasam	Greens extract (for infants)
18. Chinnapillalaku gujju	Soft cooked food for infants
19. Balahartho ambali	Ambali (Jowar flour gruel) with balahar
20. Buddalatho palu	Groundnut milk
21. Kodigruddulu pachasona	Egg yolk
22. Sajjalatho gujjuthindlu (1)	Soft cooked foods with bajra (1)
23. Atukulatho laddu	Laddus with flaked rice
24. Sajjalatho gujjuthindlu (2)	Soft cooked foods with bajra (2)
25. Regulatho halva	Ragi halva

## CHAPTER IX

# DEVELOPMENT OF MCC HEALTH AND NUTRITION COMPONENTS

**K.R. Ambuja Devi**

Inadequacy of the PHC: BMCCS Steps in — Type of Services — Delivery of Services — Beneficiaries of the Services — Functionaries and their Jobs: The Project Medical Officer; The Maternity Assistant; The Health Educator; The Dai — Basic Medical Service: Preventive Care: Antenatal Care; Intra-Partum and Post-Partum Care; Nursing Mother Care; Infant and Toddler's Check-up — Curative Care: Treatment for Minor Ailments and Nutritional Diseases; Treatment of Toxaemia — Supportive Care: Immunisation Service; Family Planning Service — Nutritional Services: Daily Food Supplements.

### *Abstract*

The principal task prior to field operation was to determine the type of health and nutritional services, when, to whom, by whom it would be offered, and in what manner it would be managed and delivered. An important component of the Mother Child Centre (MCC) activity was to provide an essential package of health and nutrition care. This chapter details the steps taken to develop this package of services, referred to as the Basic Mother Child Care Services (BMCCS).

ONE OF THE objectives of the experimental programme was to develop a tested and proven delivery system for a basic package of mother and child health services in rural areas consistent with Plan provisions for child programmes in India. Hence, while formulating the scope and content of the BMCCS, the Primary Health Centre (PHC), which represented the basic Government unit of rural health care in general, and maternal and child care in particular, was studied.

### **Inadequacy of the PHC**

Two Problem Surveys were conducted to ascertain the mortality and morbidity pattern and also to obtain information about knowledge, attitude and practices in the areas of health and nutrition. The surveys



brought out clearly that as far as the rural community was concerned, the PHC was either not utilised or very much under-utilised. Informal talks with PHC staff and interviews with selected groups of villagers yielded some important insights. According to the village community the first deterrant factor was the distance from the village to the health centres. Any distance beyond five to eight kilometres resulted in the villagers having to depend on the village *Vaid* rather than on the Subcentre or PHC. In case they did reach the health unit, often the services were not available. Sometimes when they obtained, the services were unsatisfactory due to the shortage of service personnel or drugs needed for treatment. Lastly, owing to their low economic status, villagers could not afford to pay for the travel or lose their wages for the day of absence.

The staff at the PHC also agreed that under-utilisation was due to the following constraints: the spatial area of operation of a PHC was too large; adequate manpower to deliver the services was lacking or not in position; there was a severe limitation of essential drugs even for immunisation, owing to economic stringency.

*BMCCS Steps in:* The following operational principles were therefore adopted for the BMCCS in the light of the Problem Surveys:

1. Limitation of spatial operation;
2. Delegation of a major part of the health care to the paramedical/auxiliary at the village;
3. Combination of increasing preventive and decreasing curative care, depending upon the pattern of health and disease;
4. Augmentation of the services of village *Dai* during confinements;
5. Development of a referral service with timely reference and sufficient follow-up; and
6. Building up a recording system which would codify simple abstractions of empirical data.

According to the project design, the services were to be delivered through a registered nurse-cum-midwife called Maternity Assistant and an Auxiliary Nurse Midwife called Health Educator residing at the village. They were to be backed up and given supervision, guidance and special clinical service by a doctor, the Project Medical Officer stationed at Mahbubnagar. The village *Dai* was to be the last link in the medical chain and utilised as and when her services were required for child delivery.

The BMCCS was thus to be a team work between village *Dai*,

Auxiliary Nurse Midwife, Registered Nurse-Midwife and the Medical Officer. It was important that every one had an overall idea of the services as well as awareness of their individual responsibility so that they would work together as a team. They were initiated into the programme by orienting them with the following basic components of the BMCCS:

### **Type of Services**

*Preventive Care* consisting of routine examination for detection of morbidity for various beneficiaries; ante-natal, intra-natal and post-natal examinations and anthropometric survey for the study of physical growth of children.

*Curative Care* consisting of immunisation services to all children and family planning services to all women.

In addition, *referral services* to complement these basic services and follow-up services to all the above procedures were provided.

### **Delivery of Services**

Medical Care is a programme of services that should be made available to all individuals to promote and maintain health. The traditional pattern of offering the services for consultation along with dispensation of medicine or treatment from a central point is called *ambulatory care*. This was one of the methods adopted for delivery of the BMCCS through the MCC centre located in the village. The hours of service was one hour in the morning and an hour-and-a-half in the evening after the education classes.

As some of the patients would be in a lying-in period following delivery and the centre does not provide for bed, home visits with a certain amount of nursing care had to be undertaken. This type of *domiciliary care* was allotted daily one hour in the morning.

The BMCCS was also responsible for arranging collaboration with hospitals where better facilities were available for management of total medical care. For non-available services and hospitalisation, the cases were referred to the health units. This work known as *referral services* was the third method of delivery of services.

### **Beneficiaries of the Services**

The BMCCS is *confined* to the participants chosen for the Experimen-



tal Treatment and not to the village as a whole. Every village centre selected 30 women from the village from the following three categories: (i) currently pregnant or antenatal mothers; (ii) mothers with children during 0-6 months or nursing mothers; and (iii) mothers with children during 7-36 months or weaning mothers. In addition to the mothers all their children under 36 months were included in the programme.

Every centre was given the list of the 30 selected women along with the children included for participation. It is to this population that the services were to be given by the Maternity Assistant and the Health Educator.

### Functionaries and their Jobs

The delivery of medical services was the major responsibility of the Maternity Assistant. She was assisted by the Health Educator. The Physician in charge who was stationed at Mahbubnagar visited every centre once a fortnight. The *Dai* residing in villages attended to the confinement cases. The team was to approach the service as an ancillary service to the health education classes and offer the service with the specific aim of promoting better health practices.

The *Project Medical Officer* who was the head of the team operating in the entire area which consisted of four villages in Phase I and twelve villages in Phase II, was responsible for overall management by formulating the service package, planning the programme activity and supervising and guiding other team members. She had also to develop an internal evaluation of the on-going programme and to assess and monitor the progress. She looked after the important task of orientation and training of Maternity Assistants, Health Educators and village *Dais* in operating the BMCCS. As for clinical work, she had to pay only limited attention to curative service and operated mainly in developing preventive care service promoting the positive health practices among the participants.

The *Maternity Assistant* who had two villages under her jurisdiction was responsible for antenatal care, assisted the *Dai* during confinement and provided after-care for the mother; attended the new born infant at home; gave follow-up care to the infant and toddler in immunisation, nutrition supplementation and conducted periodic anthropometric surveys. She administered simple remedies for minor ailments and attended to elementary and emergency medical care. She

had to be alert in recognising early warning signs and assisted in obtaining prompt attention of the hospital service to the high risk maternal cases, acute conditions and chronic illness, etc. Finally, she had to maintain records and report on the different services.

The *Health Educator* was responsible for teaching in the non-formal education classes or the functional literacy classes and undertake the nutrition supplement distribution according to the project design. During the development of the service a decision was made to train her so that she could participate in implementing the delivery of the basic medical services under the supervision and guidance of the Maternity Assistant. This step was taken in view of her being the pivotal point of Health Care in the PHC set-up of the Government.

The involvement of the *Dai* was to serve the double purpose of involving the community participation in the programme and making her the residual person to continue some safe maternity practices when the programme was withdrawn. Hence, her role was to attend to all the normal confinement cases during the programme period, with the Maternity Assistant and Health Educator acting as observers. This helped in the educative role of a person being around and slowly encouraging the *Dai* to adopt aseptic techniques in conduction of labour. (Incidentally, the observation role turned out to be doubly educative in that the trained nurses and ANMs learned some good local village maternity practices from the *Dais*.)

An essential component of the planning and administering of the programme was to accurately record and determine whether initial aims, objectives or targets had been reached and to assess the impact of the health intervention. As the major operations were undertaken at the village by the village worker, routine observations recorded and reported by them were the mainstay of evaluation and monitoring. In order to overcome the problem of inaccurate or incomplete information which would not provide a base for analysis, the specific manner in which each activity were to be recorded was standardised and these records formed the monitoring procedures of the BMCCS.

### Basic Medical Service

*Preventive Care:* This consisted of routine periodic examinations of the physical condition of the selected women and children to observe the status of health. It was carried out irrespective of presence or absence of illness. In the case of the women it was cyclic activity



depending on status of the pregnancy or lactation period, while in the case of the children it was a linear activity undertaken from the date of enrolment in the programme to the end through a regular periodic testing. This consisted of antenatal care, intra-partum care, nursing mother care and infant and toddler's check-up.

*Antenatal Care:* Five visits were planned for the total period of pregnancy during which weight, blood pressure, urine, Hgb., and abdominal examination were to be carried out. The visits were to be twice before 24-32 weeks and once during 24-32 weeks and twice during 32-40 weeks. Arrangements were to be made for confinements at home along with the village *Dai*. The participants had a minimum of two check-ups, one of which was during 32-40 weeks by the Project physician.

*Intra-Partum and Post-Partum Care:* The Maternity Assistant along with the village *Dai* attended normal confinement. The Maternity Assistant recorded the labour report, birth weight and general condition of the child. She prepared the infant for primary vaccination. The mother received four visits after the first day to record involution of uterus, condition of lochia and T.P.R.

*Nursing Mother Care:* Each participant was visited at least once in three months. The presence of nutritional deficiency signs, menstrual history, and general complaints were recorded. Early detection of pregnancy was reported for introducing antenatal care. Advice on contraception was also given.

*Infant and Toddler's Check-up:* Every child below 11 months was visited once a month and children of 12-36 months of age once in two months. Weight and height measurements were taken and a direct clinical assessment for nutritional deficiency signs and physical examination for latent illness was also done. Further, history of illness between the check-ups was noted.

## Curative Care

*Treatment for Minor Ailments:* Consultation and medication along with simple remedies for minor complaints of the mother and child were undertaken by the Maternity Assistant/Health Educator. Problem cases were put up to the Medical Officer at the time of the weekly or fortnightly visits.

*Treatment for Nutritional Diseases:* Consultation and medication were carried out by the Project Medical Officer during regular visits to

village centres. The follow-up and progress were reported by Maternity Assistant/Health Educator.

*Treatment of Toxaemia (Blood Poisoning):* Toxaemias of pregnancy detected during routine check-up or routine medical check-up by physician were treated under the instruction of the Medical Officer.

### Supportive Care

*Immunisation Service:* A Schedule for small-pox, D.P.T. and anti-polio vaccinations (when available) to the child participants of the programme was drawn up and administered by the Maternity Assistant/Health Educator.

*Family Planning Service:* Contraceptive advice to nursing and weaning mothers was given during the routine check-up. Contraceptives were obtained from the Block authorities and issued. Cases for sterilisation were taken to available service area. A follow-up service was made available along with routine check-ups.

All the above procedures had individual pro-forma and instruction sheets for recording the services.

### Nutritional Services

The adverse effects of either under-nourishment or malnourishment have been the major factors influencing good health, especially in the case of pregnant or lactating mothers and the young child. In view of this the nutritional services were integrated with basic health care of the MCC activity. One of the major problems facing the project workers was the high incidence of nutritional morbidity in expectant and nursing mothers and children during toddler stage.

The nutrition intervention offered by the Project had two distinct aspects: (1) Nutrition Supplementation, and (2) Nutrition Education. While the latter has been discussed in the chapter on Nutrition Education and their Revision, here we would consider how the former was organised in the BMCCS.

*Daily Food Supplements:* The project design envisaged that daily food supplements would be provided to three categories of women considered nutritionally vulnerable, i.e., women in the last trimester of pregnancy, lactating mothers and weaning mothers and their children in the ages of 6-36 months. Ideally, before starting this feeding



programme, it should be decided what is an adequate diet and what supplements have to be provided. In order to achieve this end, careful surveys of nutritional problems of the participants, identification of practical and locally available foods, and an understanding of cultural factors influencing the consumption pattern would be necessary. Since this would be a time-consuming process and would not fit into the time frame of the Project, it was decided that all the participants would be provided with nutrition supplements (*Balahar* and Salad oil) obtained from CARE through the Department of Social Welfare, Government of Andhra Pradesh. A woman was to receive 198 gm of *balahar* and 42.5 gm of salad oil and a child 99 gm of *balahar* and 7.1 gm of salad oil.

The nutritional supplement was distributed daily for six days in a week to the woman participants who attended the educational classes. The ration for the child was also given to the woman. So the method of distribution was a 'take home method'. To ensure that the major part of the supplement would reach the target population, observational checks were made by the Maternity Assistant/Health Educator during the domiciliary visits.

In addition to the supplement, women and children received 5 mg and 1 mg of Iron and Folic acid tablets respectively. The vitamin A concentrate in two doses were also supplied where there was evidence of Avitaminosis. The distribution of both the food and drug supplement was the responsibility of Health Educator who distributed the food and maintained the records.

The programme of nutrition service component was developed for implementation prior to the field operation. It was initiated in July 1973 in Phase I. A workable procedure was achieved towards the end of Phase I and the model was operated after due modifications in Phase II starting in April 1974.

**Part III**

**PROGRAMME OPERATIONS**



## CHAPTER X

# FUNCTIONAL LITERACY

M.L. Rao

Functional Literacy and Non-formal Education — The Problem of Dependent Children — Methodology: The Letter and the Sound — The Flash Cards — Graph Copying Cards — Types of Exercises — Teaching Arithmetic — Positive Response.

### *Abstract*

The concept of Functional Literacy and Non-formal Education had to be tried out in classroom situations. The problems faced by the teaching staff and the methodology employed through Weekly Lesson Guides, Flash Cards, Copying Cards, etc., are described in this chapter.

THE CONCEPT OF functional literacy, the fundamental differences in scope and content between traditional literacy and functional literacy and the manner in which literacy could be linked to health, nutrition, child care, and family planning — all this was explained to the Teachers and Supervisors during their training. Practical steps in organising the FLIT Centres and the use of the specially prepared teaching materials and aids were also explained to them. The trainees of Phase II also did some practice teaching in the FLIT Centres of Phase I.

Functional literacy classes were conducted in six MCC+FLIT centres by Health Educators and in four Literacy Centres by Literacy Teachers in Phase II. They were guided by Maternity Assistants/Functional Literacy Supervisors. The classes were generally conducted for one hour between 7 p.m. and 9 p.m. for six days in a week.

### **Functional Literacy and Non-formal Education**

The curriculum for functional literacy was the same as that for non-formal education. It was expected that the knowledge received while acquiring the skills of reading and writing would lead to changes in attitudes and practices of the women participants.

The women generally attended the classes with one or two children, usually one infant and an older child about four years old. When the mother wanted to write on the slate, she would ask the old child to hold the baby. *If the baby cried or disturbed the class, the older child took the baby outside. In short, one cannot think of a more unacademic setting for an adult literacy programme than a group of mothers with one or more children clinging to them while trying to learn the skills of reading and writing their mother tongue.*

### The Problem of Dependent Children

In order to try to solve this problem, a girl was appointed to look after the children while the mothers were attending the literacy programme, but mothers were reluctant to send their children away and even if they did, they frequently went out to see what the children were doing or to feed a crying baby. This disturbed the entire group and the services of the baby-sitter were later dispensed with.

The participants were made to sit in U-shaped manner and the Functional Literacy Teacher/Health Educator sat at the open end. The roll-up black board was hung on the wall behind the teacher. The teacher kept ready all the flash cards, word builders, word picture cards, and other charts necessary for the lesson of the day. She also had in position the slates, slate pensils and lessons so that no time was lost after the arrival of participants. The attendance was marked three times, once at the beginning, second time after the class had progressed for half an hour and the third time at the end of the class.

### Methodology

Classes were conducted as per instructions given in the Weekly Lesson Guide supplied to them. The Weekly Lesson Guide contains the details on the message to be transmitted, the lesson number and card numbers, the method of teaching, the type of exercises to be conducted, and instructions on the flash cards, word builders and word picture association cards to be used.

*The Letter and the Sound:* Great emphasis has been laid in the Lesson Guide on the need for establishing the association between the written form of a letter and the corresponding sound and vice-versa so that the letters learnt were stabilised. The Lesson Guide specified the exercises to be done in reading and writing. The exercises on filling in



blanks and ordering of letters to make words correctly were specified on the appropriate days. Instructions were given clearly on the need to follow the Lesson Guide carefully in the discriminative exercises concerning similarities and differences in letters in given letters or pairs of words. The importance of doing the exercises on copying in the manner specified by arrows in the given cards was stressed so that the participants would learn the correct way of writing.

### The Flash Cards

The first step in achieving literacy skill was that the association between the written form of a letter and the corresponding sound and conversely between the sound and its associated written form should be clearly established. In order to attain this goal, the word picture association cards were introduced in the Phase II Functional Literacy card sets. For the same purpose, in addition to word picture association cards, flash cards, on which the letters were written prominently in big size, were used intensively. A detailed note in Telugu on the method of using such flash cards was circulated to all the Teachers/Health Educators. This note was clearly explained and the method of practice was also demonstrated.

### Graph Copying Cards

Apart from the normal complement of word-picture association cards introduced in the FLIT programme, an additional set of word-picture association cards was provided to each centre to sustain the interest and to complement the printed FLIT cards. Word building cards to practise formation of words were also used. For learning the manner of writing Telugu letters, graph copying cards were introduced. In these cards the manner of copying the letter (from the starting point to the end point) was indicated by arrows. In order to see that there was sufficient writing practice, several copying cards giving three or four words in bold print were introduced.

### Types of Exercises

To stimulate the thinking and discrimination capacities of the participants, different types of exercises were introduced in each lesson unit. The important exercises are briefly described below.

1. A set of words were given and a letter from each word was written separately. The participants were then asked to identify those letters in the words.
2. Some words were given omitting one letter and the participants were asked to fill in the blanks with appropriate letters.
3. The letters in a set of words were given in a wrong order and the participants were asked to put the letters in correct order and form the words.
4. In some sentences the words were given in a wrong order and the participants were asked to put the words in correct order to make the sentence.
5. A set of letters was given and the participants were asked to read those letters identifying the similarities.
6. Pairs of words were given and the participants were asked to read similar letters in those words.
7. Sets of words were given and the participants were asked to identify the similarities and differences in them.
8. Double consonant letters were given and the participants were asked to identify the similarities in them. They were also asked to recapitulate some words containing those double consonant letters and write them.
9. Some pairs of words were given in which one letter in each (in red colour) looks more or less similar and one may confuse one letter for another. The participants were asked to recognise the differences and identify the letters.
10. The usual routine exercises on reading, writing of word and sentences were included.

### **Teaching Arithmetic**

In the teaching of arithmetic also, a new approach was followed. For introducing numerals, number picture association cards were used. Likewise picture cards were used initially for teaching of addition and subtraction. Several cards were introduced for practice of the arithmetical operations – addition, subtraction, multiplication and division.

The Daily Log Sheets (DLS) filled in by the Health Educators/Teachers were collected at the time of visits by the Project Officer (Literacy). These log sheets were quickly scrutinised in the field to point out to the Teachers such items which needed immediate



action and rectification. Also guidance was given for future work. The collected DLS returns were handed over to the Research Officer on the next day for analysis.

### **Positive Response**

Public reaction to the working of Functional Literacy Centres was on the whole favourable and positive except that one particular community felt that the programme was inspired by the Department of Family Planning. Villagers also felt aggrieved that only a fraction of the village women and children were included in the programme which wished to enlist the cooperation of every woman in the village. Where the MCC programme was not in operation along with the FLIT programme, the participants in the latter felt they were cheated of medical care and food which was available for the MCC+FLIT centres.

## CHAPTER XI

# NON-FORMAL EDUCATION

**Hari Adiseshu**

Recruitment Procedures — Training Schedules — Getting to know the Selected Participants — Organising the Centres — The Classroom — Starting with the Photograph: 'Known to the Unknown' — Need for Even Progress among Centres — Learning through Discussion — The Course Content — The Problem of Chronic Absenteeism: Effective Enrolment: Effect of Home Environment: Reasons for Absenteeism — Departmental and Staff Difficulties.

### *Abstract*

The steps taken to develop the necessary infrastructure, the training schedules, organisation of the Centres, the problem of absenteeism and departmental and staff difficulties are discussed in this chapter.

WHEN THE PROJECT was designed, it was fully realised that the field programme staff would have a pioneering role to play in this experimental study. Their academic qualifications, experience in life, maturity of mind, familiarity with the local language, their tact and ability to deal with any situation that might suddenly come up, would go a long way towards contributing to the success or failure of the experiment. These considerations were kept in mind while recruiting them.

### **Recruitment Procedures**

In order to recruit the action programme staff, information about these vacancies, nature of their work, salary and other conditions of service were sent to Nurses' Training Schools, Teachers' Training Schools, Employment Exchange and the concerned offices at the district level. The aim was to recruit candidates from the Telengana area as the language spoken there (Telengana Telugu dialect) was different from the coastal area Telugu. The qualifications laid down for these positions and the number required were:



Designation	Formal qualifications	Number required	
		Phase I	Phase II
Maternity Assistant Health Educator	Certificate in General Nursing	2	6
Functional Literacy Teacher	Auxiliary Nurse Midwife Certificate	4	12
Literary Supervisor	Secondary School Leaving Certificate, and Secondary Grade Basic Training Certificate	1	2
Functional Literacy Teacher	Elementary Grade Basic Training Certificate	2	4

Of the personnel recruited on the basis of qualifications mentioned above, twelve field workers had no previous experience in teaching while eight had some experience. With the exception of two of the Literacy Teachers, all the others were in the age-group of 20-25 – perhaps too young to be effective Non-formal Educators of rural women, most of whom were older and more experienced in life. Further, only ten workers were married.

### Training Schedules

For organising the training programme it was decided that about two-thirds of the total training time of six weeks should be used for pre-service training and the remainder for in-service training courses of short duration. A draft syllabus was drawn up for a pre-service training of about four weeks duration and was divided into four main sections: (1) background and orientation to the project; (2) subject-matter content; (3) implementation of programme in the field including practical work in teaching methods, use of audio-visual aids, medical check-up; and (4) role of field staff in assisting research and evaluation.

The training course for staff in Phase I was conducted from 4 to 21 June 1973 at Hyderabad and from 22 to 29 June 1973 at Mahbubnagar and in the villages selected for Phase I. The training course of staff in Phase II was conducted from 17 September to 4 October 1973 at Mahbubnagar as the action programme in Phase II was to begin in the first week of October 1973. The medium of

instruction was Telugu and a few talks that were in English were translated into Telugu. During both the training programmes, the trainees accompanied by directing staff visited places of interest such as: (1) Indo-Dutch Project in Chevella Block; (2) National Institute of Nutrition, Hyderabad; (3) College of Home Sciences, Hyderabad; and (4) Regional Family Planning Training Centre, Hyderabad.

The second part of the training which was held at Mahbubnagar and in the selected villages consisted largely of preparation of lesson plans, practice teaching, conducting group discussion, getting acquainted with the villages and village people. At the end of their training they were posted in the villages which had been assigned to them. During the entire period of Phase I and Phase II action programme, the staff were brought to Mahbubnagar as often as necessary but invariably on the last day of the month which was used mainly as briefing sessions.

### **Getting to know The Selected Participants**

Before starting action programme in the selected villages for Phase I and Phase II, a programme for sensitisation of the villages and motivation of the prospective participants was carried out. For this purpose three teams consisting of Project Officers and concerned Supervisors and Teachers/Health Educators, were formed. Each team visited the villages assigned to them, explained to the village leaders the programme for that village and then talked to the selected women individually or in groups and the details of the programme were explained to them. The husbands and mothers-in-law of the women included in the programme were also contacted. Women who were not included in the sample asked the motivation team as to why they were not selected. To them a detailed explanation about the nature of the project, the limitation of research study, random selection of sample from eligible women, etc., was given so as to win their goodwill. They were also informed that in an emergency, the services of the health staff in MCC would be available even to those who were not in the programme.

### **Organising the Centres**

During the training programme itself, the Health Educators, Maternity Assistants, Teachers and Supervisors were taken to their



respective villages by the Project Officers and introduced to the village leaders who were requested to look after these field workers during their stay in the village. In general, the field staff did not encounter any serious difficulty in staying or working in the village – with the exception of two workers, who had to be transferred or dismissed, and the rest of the staff completed the term of their assignment in the villages.

The Health Educators were given the first and second priority lists of the women selected to be participants by the Research Section of the Project. The Health Educators were instructed to meet every one of the participants in their homes to get acquainted with them, to ask them about the time convenient for them to attend classes and finally to invite them to the MCC or MCC+FLIT Centre, as the case might be. They were advised to complete the round of visits within a few days, all the while trying to build up rapport not only with the participants but also with the elder women in the families like the mother-in-law and sister-in-law, or others who generally wield authority in the families.

The Maternity Assistants, who supervised the work of two Health Educators, were instructed to help the latter in establishing the Centres. The field staff were further instructed to report to the Project Officers all the criticisms, objections and resistance to the action programme met with by them from the participants or others in the village in the course of getting the Centre established.

### **The Classroom**

One of the three components of the Mother Child Centre was non-formal, structured education of the mothers enrolled in the classes. The materials for this programme consisted of a Discussion Guide, a Source Book, and visual materials such as photographs, charts and posters; all these were based on the integrated curriculum mentioned earlier. Weekly Lesson Guides were also provided to the Health Educators from December 1973. Each class was conducted by the Health Educator assigned to that village.

She was guided and supervised by a Maternity Assistant during three days every week. The classes met for about an hour and a half between 7.30 and 9.30 p.m. every day, six days a week, except on public holidays. A bell was rung 30 minutes before the scheduled time, again after 15 minutes and a third bell just before the class was to

begin.

As the participants came in, most of them with one or two young children with them, they were seated in a U-shaped manner. The Health Educator sat at the open end, with the black-board, charts, etc., needed for the evening on the wall, behind her. The village women were not very time-conscious, and so the Health Educator usually allowed a few minutes, after the scheduled starting time, for the late-comers to join. Then she took the roll-call and the attendance was recorded in a specially designed register.

### **Starting with the Photograph**

To start a discussion on a problem/topic in the curriculum, the appropriate photograph or other illustration depicting the problem or directly connected with the problem was first shown to the group. Then the Health Educator posed some questions to lead the participants into a discussion of the problem. By using questions suggested in the Discussion Guide, the discussion was conducted by her and through this method, the message or messages were transmitted to the participants. The appropriate visual materials indicated in the Weekly Lesson Guide were also used and the group was asked to consider solutions to the problem and the action to be taken by them. In the case of some problems or topics, where live demonstrations were necessary, the Health Educator, usually with the guidance and help of the Maternity Assistant, arranged for such demonstrations. Towards the end of the class-time, the Health Educator gave a summary of the day's lesson, stressing the main messages of the lesson and action to be taken.

*'Known to the Unknown'*: Thus, the method used was based on the educational principle of 'known to unknown' through guided group discussion. At the conclusion of the day's lesson, roll-call was again taken and recorded to mark those who had come in after the first roll-call. The basic maternity services and distribution of medicines and supplementary food was done after the class was over and such services were given only to those who attended the class.

When the group met the next day, the Health Educator would begin the class with a recapitulation of the previous day's lesson and the messages it conveyed and would clear the doubts, if any. Then she went on to introduce the day's lesson as described above. Each class was visited by the Project Officer (Materials Preparation) at least



twice a week for supervision, guidance on group discussion and any further explanation of subject-matter.

### **Need for Even Progress among Centres**

In the first five months of Phase I, the Health Educators were allowed some flexibility with regard to the time necessary for covering a problem/topic, but it was found that the rate of progress was uneven and varied considerably from centre to centre. Therefore, in December 1973, the centres lagging behind were given about two weeks to catch up with the others; the latter were asked to review the previous lessons and not to proceed with new lessons. This was done in order to bring all classes to the same stage in the curriculum, so that Weekly Lesson Guides could be introduced from then on.

From the middle of December 1973, Weekly Lesson Guides prepared by the Project Officer (Materials Preparation) were distributed to each centre and the Health Educators were asked to try to cover each day's lesson as indicated in Weekly Lesson Guide. This procedure has been of great help to the Health Educators in covering the problems/topics in the syllabus. The last two weeks were utilised by them for review of the entire course of non-formal education in MCCs.

### **Learning Through Discussion**

The women participants had never been to a school or participated in any educational activity earlier. So, they needed a little time to adjust themselves to this programme based on discussion as a method of learning. The Health Educators conducted also some practice lessons in the beginning of Phase II, from 29 April to 18 May, 1974. By that time, conditions had stabilised and the regular classes as per course content were started. The unitised lessons covering the subject areas, relating to Maternal Health Care commenced on 20 May 1974.

A set of twenty-two lessons covering the subject were given in the centres during the period from 20 May to 8 July, 1974. In view of the special importance of this subject area to rural mothers, twelve revision lessons on this chapter were programmed during the period 12 to 30 July, 1974. The impact of these lessons on the participants in six MCC and six MCC+FLIT Centres was assessed by the Project Officer (Evaluation) during September 1974. Of the 70 participants

who were examined, 35 secured 35 per cent or more.

### **The Course Content**

A set of thirteen lessons relating to the subject area of Child Development and Rearing Practices was covered from 1 to 16 November, 1974. This was followed by a set of twenty lessons relating to the subject area of Health Care of Infants and Toddlers. They were programmed during the period from 20 November to 12 December, 1974. A set of four lessons covering the subject area of responsible parenthood was programmed during 13 and 18 December, 1974.

These were followed by the lessons relating to the last subject area in the course content, viz., General Knowledge. It covered information on available services, agriculture, crops of the district, growing of vegetables, poultry, responsibilities of a citizen, and democracy. These lessons, twenty-eight in number, were covered between 20 December 1974 and 7 February 1975.

Having completed the course content at a reasonable pace, it was felt that a set of nine revision lessons covering the total course content and an internal assessment were desirable. Though, they were programmed between 8 and 19 February, 1975, only four of the revision lessons could be covered, as the classes and activities in all the centres were stopped on 15 February 1975. However, the internal assessment was completed by the Project Officer (Materials) in all the six MCC and six MCC+FLIT centres between 12 and 28 February, 1975. The results obtained and the analysis of the answers given by the 141 participants were useful in the revision of materials. Ninety-one members out of the 141 participants examined secured 12 points or more out of a maximum of 30 points.

### **The Problem of Chronic Absenteeism**

Some of the problems faced in implementing the programme of Non-formal Education in Phase II are presented here. The major ailment suffered by the programme was chronic absenteeism on the part of the participants.

*Effective Enrolment:* The number of participants enrolled and the number of absentees resulting in a considerably reduced effective enrolment is given in Table I (see Appendix 8).

The magnitude of chronic absenteeism in MCC and MCC+FLIT



centres was quite high and required some consideration. It was indeed strange that the attendance could be so low even when incentives in the form of medical care and supplementary feeding were provided. The problem required scrutiny and solution. Therefore, an examination of the educational status of the husbands of the participants was attempted and the information is presented in Table II (see Appendix 8).

*Effect of Home Environment:* It will be observed from Table II that the husbands of only 94 participants out of the 317, i.e., 29.6 per cent enrolled in the twelve centres were literate. Twenty-two out of the 94 such participants, i.e., 23.4 per cent of those with a literacy environment at home were among the chronic absentees. Similarly 223 participants out of the 317 participants, i.e., 70.4 per cent enrolled in all the twelve centres had an illiteracy environment at home. Seventy-eight out of those 223, i.e., 35.0 per cent were among the chronic absentees. These data indicate that the literacy or illiteracy environment at home plays a considerable role in chronic absenteeism of an illiterate woman enrolled for an educational programme. The chance for absenteeism may be considered to be enhanced nearly by one and half times by an illiterate environment at home.

*Reasons for Absenteeism:* Average monthly attendance for 10 months is given in Table III (see Appendix 8). In an educational programme, attendance and regularity of the participants is an index of the response to the programme and the success achieved by it. The following factors markedly influenced the attendance of the participants in the Non-formal Education classes.

- The imperative need for earning 'daily wages' for making a living is a common problem faced by the rural women. They have to seek work wherever it is available, and they can never be sure of finding work in their own village all through the year. So they have to migrate to nearby or far-off places in search of work. This migration inevitably reduces their effective participation in an experiment. Paying a visit to the mother's place is a common tendency among village women. In the case of young mothers, it is more frequent. Festivals and Jataras are also responsible for the movement of the rural folk from place to place. Short visits originally planned often turn out to be long ones of considerable duration.
- The selected sample consists of ten currently pregnant women as participants in each of the villages. Some confinements could

naturally be expected as a common feature in every centre. Absence on account of the arrival of the new child varies from 3 to 8 weeks.

- Besides these factors, rain, darkness, courtesy visits of relatives, occurrences like death, birth, marriage, local entertainment, accidents in the village, quarrels among the participants, scare created by quarrelsome husbands who would not tolerate any delay in the return of their wives from the Centre, were some of the other reasons influencing the day's attendance.

A total of 158 participants in each of the MCC and MCC+FLIT centres were enrolled in Phase II programme. The factors enumerated above affected the sample and among the participants there were chronic absentees. The attendance of the number of participants month by month from May 1974 onwards till February 1975 reveals that 69 out of 106 participants or 65 per cent were present on an average during any month in the MCC centres while 83 out of 111 participants or 74.8 per cent took advantage of the programme in the MCC+FLIT centres.

### **Departmental and Staff Difficulties**

It was also noticed that during the first five months of the programme, i.e., May 1974 to September 1974 (both inclusive) the participation steadily increased in both the MCC and MCC+FLIT centres. The attendance during those months touched the maximum of 80.2 per cent in the case of the MCC centres and 88.3 per cent in the case of the MCC+FLIT centres. This period also synchronised with the period when work for the agriculture-labour participation would generally be available in the villages. This period was followed by a period of decline in attendance touching the minimal in class attendance during the phase, viz., 55.7 per cent in the case of MCC villages and 58.6 per cent in the case of MCC+FLIT centres. The decline in attendance during the period that followed October 1974 was also probably caused to some extent by: (i) lack of the Salad oil for distribution during October 1974, (ii) absence of glamour for the programme which by that time had become quite familiar, and (iii) migration of participants seeking work elsewhere.

The young women workers were also exposed to problems of different kinds. These were: infection and periodic illness caused by insanitary conditions, emotional stresses and strains, inter-staff relationship, and lack of teaching aids.



## APPENDIX 8

TABLE I: Effective enrolment by centres (Phase II)

Name of the Centre	Enrolment	Chronic absentees	Effective enrolment
<i>A. MCC Treatment</i>			
Maddigatla	25	14	11
Elkicherla	30*	11	21
Md. Hussainpalle	28	6	23
Nizalpur	27	3	24
Bandarpalle	30	12	18
Gurakonda	19	7	12
Sub-Total	159	53	109
<i>B. MCC+FLIT Treatment</i>			
Kotha Molgara	30	7	23
Patha Molgara	26	13	13
Polkampalle	24	5	19
Tadikonda	24	8	16
Parpalle	26	9	17
K. Malkapur	28	5	23
Sub-Total	158	47	111
Total	317	100	220

\*Includes three participants who were admitted on 5.9.1974.

TABLE II: Educational status of husbands of participants by centres (Phase II)

Name of the Centre	No. of participants whose husbands are literate	Chronic absentees among them	No. of participants whose husbands are illiterate	Chronic absentees among them
<i>A. MCC Treatment</i>				
Maddigatla	8	5	17	9
Elkicherla	5	5	25	6
Md. Hussainpalle	5	—	23	6
Nizalpur	11	1	16	2
Gurakonda	8	2	11	5
Sub-Total	49	16	110	37
<i>B. MCC+FLIT Treatment</i>				
Kotha Molgara	13	1	17	6
Patha Molgara	4	—	22	13
Polkampalle	4	—	20	5
Tadikonda	1	—	23	8
Parpalle	11	4	15	5
K. Malkapur	12	1	16	4
Sub-Total	45	6	113	41
Total	94	22	223	78



TABLE III: Average attendance of the participants in Non-formal Education, month by month in Phase II

Name of the Centre	Effective enrolment	Average number of participants attended											
		May '74	June '74	July '74	Aug. '74	Sep. '74	Oct. '74	Nov. '74	Dec. '74	Jan. '75	Feb. '75	Total	
A. MCC Treatment													
Maddigatla	11	5.2	6.7	9.6	10.6	7.7	6.4	8.0	7.6	7.2	7.2	7.5	
Elkicherla	21	11.3	10.3	14.0	13.4	13.4	13.1	13.2	13.5	13.8	13.7	13.0	
Md. Hussainpalle	23	15.0	16.3	15.4	15.7	15.8	11.0	10.7	11.5	10.9	11.1	13.6	
Nizalpur	24	15.8	18.9	22.0	19.8	17.8	13.3	13.5	13.0	11.7	11.3	16.1	
Bandarpalle	18	9.5	12.5	15.1	16.0	15.9	7.6	8.3	9.0	7.6	10.3	11.0	
Gurakonda	12	4.1	6.6	7.7	10.4	10.6	7.5	7.4	3.6	7.4	9.7	7.4	
Sub-Total	109	61.0	71.0	84.0	85.0	80.0	59.0	62.0	59.0	59.0	64.0	69.0	
B. MCC+FLIT Treatment													
Kotha Molgara	23	16.7	16.7	19.7	19.1	18.5	11.7	15.9	18.4	15.4	16.1	17.0	
Patha Molgara	13	7.0	9.2	11.5	12.1	10.4	8.0	8.0	9.4	8.0	9.3	9.3	
Polkampalle	19	15.1	16.5	17.6	17.8	16.6	14.0	15.0	14.7	13.8	15.5	15.8	
Tadikonda	16	7.2	10.0	11.8	13.5	12.1	10.9	10.4	9.2	8.7	10.9	10.7	
Parpalle	17	13.8	14.1	14.7	14.2	10.3	8.5	9.6	12.4	11.9	10.7	12.2	
K. Malkapur	23	16.6	18.9	21.2	21.8	18.3	15.4	16.4	16.5	16.6	13.7	17.9	
Sub-Total	111	79.0	87.0	98.0	97.0	89.0	65.0	78.0	83.0	75.0	76.0	83.0	
Total	220	139	155	182	182	169	134	142	145	131	145	153	

## CHAPTER XII

# NUTRITION EDUCATION

K. Chittemma Rao

Orientation Training Programme: Nutrition Lessons on Alternate Days — Some Objections to Nutrition Messages — Monitoring and Feedback.

### *Abstract*

The Programme of Nutrition Education was implemented in Phase II from 1 August 1974 to 31 October 1974. The Functional Literacy Teachers and the Health Educators conducted the non-formal discussions and food demonstrations in the experimental villages.

BEFORE THE PROJECT was launched, a two-day Orientation Training Programme was organised for the Educators and Supervisors. An initial study had been conducted to ascertain the knowledge, attitude and practices of the field workers and had identified the areas to be strengthened for improving their competence to conduct the Nutrition Education classes. The information thus obtained was utilised in developing the two-day Orientation Training Programme in Nutrition.

### **Orientation Training Programme**

The Orientation included the methodology of conducting non-formal discussions, use of available education materials, handling of different types of visual aids, filling up of DLS forms, etc. Model nutrition discussions and demonstrations were conducted during the orientation course. Practice discussions and demonstrations were also organised.

*Nutrition Lessons on Alternate Days:* Nutrition lessons in MCC+FLIT Centres were given on alternate days. On Mondays, Wednesdays and Fridays nutrition classes including the corresponding food demonstrations were covered while on Tuesdays, Thursdays and Saturdays functional literacy classes were conducted in MCC+FLIT. In the functional literacy centres half of the class-time



every day was spent on nutrition education whereas in MCC centres the lesson and the demonstration were given on alternate days in the week. The time distribution of the class treatment is given in Appendix 9.

It will be seen that the time spent on nutrition education programme in functional literacy and joint centres was only half the time that was spent in MCCs. Another feature was that actual food demonstrations were not given in functional literacy centres but the recipe was explained to the participants. This has to be kept in mind while comparing the results between the three treatments.

Observations of the Nutrition Consultant revealed that in 85 per cent of the classes, the Educators adhered to the Weekly Lesson Guides (see Appendix 10). In cases where it was not followed, it was primarily due to rain or illness of the Educator or non-availability of ingredients for food demonstrations.

### **Some Objections to Nutrition Messages**

The percentage of objections to the nutrition messages was initially high and ranged between 10 and 20 per cent. Participants invariably felt that items such as milk, dals, vegetables and fruit were very expensive and the poor cannot afford these items of food. Objections regarding the nutritive value of foods, food habits and beliefs, were considered and the Nutrition Consultant motivated the participants to learn about different foods and their relation to health. It was explained to them that this knowledge regarding foods would motivate them to grow and produce protective foods. It was brought home to them that even though they had land and irrigation facilities to some extent, they had not taken advantage of this natural facility for growing vegetables for their own consumption.

Special attention had to be paid to the problem centres where the Educators were diffident due to their inability to communicate efficiently and owing to lack of understanding of the nutrition education material.

### **Monitoring and Feedback**

Monitoring and encouragement of teachers was accomplished by instituting a fortnightly circular letter to improve specific aspects of the programme. The importance of emphasising the nutrition

messages and linking them with the demonstrations was pointed out. The apportioning of class-time and methods for reviewing the previous day's work was also emphasised. Health Educators were told that faith and conviction in what they teach and sympathetic listening to participants' questions were essential. Use of the local dialect and making proper seating arrangements for all were stressed. The teachers were alerted to record verbatim reasons for message objections and fill up the DLS forms correctly.



## APPENDIX 9

## Non-formal Education - Nutrition Education: A Sample Weekly Lesson Guide

Date/day	Unit/number Food demonstration	Important messages	Discussion/ demonstration	Visual aid
9.9.1974 Monday	Nutrition Unit 16. Importance of diet during lactation.	<ol style="list-style-type: none"> <li>1. The breast-fed child derives strength from the mother.</li> <li>2. Mother synthesises breast milk from her blood.</li> <li>3. In a day a nursing mother secretes half a litre of milk on an average.</li> <li>4. A nursing mother may not have good secretion of milk if she does not take good food.</li> <li>5. Nursing mother draws substances from her bones, blood and tissue and synthesises milk in case she does not eat well.</li> <li>6. If a nursing mother conceives again, she has to provide nutrients from her blood for the foetus and breast-fed child.</li> </ol>	Discussion	PNU-4
10.9.1974 Tuesday	Food demonstration.	If any one of the demonstrations which was scheduled earlier is not demonstrated, demonstrate it today.	Demonstration	—
11.9.1974 Wednesday	Nutrition Unit 17. Story of a nursing mother 'Kistamma'.		Discussion	Story of 'Kistamma' along with flash card set.

(Contd.)

## APPENDIX 9 (Contd.)

Date/day	Unit/number Food demonstration	Important messages	Discussion/ demonstration	Visual aid
12.9.1974 Thursday	Food demonstration 13. Curd's Chutney with palak.	—	Demonstration	
13.9.1974 Friday	Some suggestions to a nursing mother.	<ol style="list-style-type: none"> <li>1. It is not true that prolonged breast feeding delays next pregnancy.</li> <li>2. It is not advisable to breast feed the child up to third trimester of pregnancy.</li> <li>3. One should stop breast feeding by the end of 1st trimester of pregnancy.</li> <li>4. There is no need to give chilli powder, roti or garlic to a nursing mother with a belief that they avoid oedema.</li> </ol>	Discussion	PNU-10
14.9.1974 Saturday	Food demonstration 14. Puntikura Thokku.	—	Demonstration	



## APPENDIX 10

Time Distribution of the Classes, Treatment-wise

Day	FLIT		MCC+FLIT		MCC
Monday	Nutrition Lesson Unit	- 30 mts.	Review of functional literacy	- 10 mts.	Review of food demonstration
	Functional Literacy	- 30 mts.	Nutrition lesson unit	- 20 mts.	Nutrition lesson unit
Tuesday	Functional literacy	- 30 mts.	Food demonstration	- 30 mts.	Review of nutrition unit
	Food demonstration (only explanation of the recipe)	- 30 mts.	Review of nutrition lesson and demonstration	- 10 mts.	Food demonstration
			Functional literacy	- 50 mts.	Food demonstration - 45 mts.

## CHAPTER XIII

# MCC HEALTH AND NUTRITION COMPONENT

K.R. Ambuja Devi

Methodology — Logistics: Walkable Distance between Two Villages — Personnel Problems: Phase II Staffing Pattern; Disincentives; Health Educators' New Role — Life in the Villages: The Marital Status; Worthwhile and Rewarding Experience — Job Training: Breakdown in Service Averted — The Village *Dai* — Traditional Practices: The Role of the *Dai*; The Mother and the Child — Guidelines for Training the Village *Dai* — Basic Health Services: Beneficiaries Covered; Ante-natal, Nursing and Weaning, Infants, and Toddlers — A New Forum for Health Education — Immunisation Programme — Analysis of the Three Major Categories of Services: Individual Medical Care and Group Teaching; Eight Main Types of Service — Negative Attitude Towards Family Planning — Periodic Check-ups — Pattern of Utilisation — Pattern of Morbidity and Treatment: Chronic Under-nourishment; Recurrent Infections; Curative Care; Internal Referral Service — How the Burden was shared: External Referral Service — Nutrition Component of MCC: The Food Supplements; 'Take Home System' — Did the Target Group Receive the Ration?

### *Abstract*

This chapter attempts to give a general account of the delivery system for the MCC health and nutrition component of the services between July 1973 and February 1975.

THE HEALTH AND nutrition component introduced in the Project was termed 'Basic Mother Child Care Services' (BMCCS). The pattern of services planned to be implemented in the field experiment has been described in Chapter IX on 'Development of MCC Health and Nutrition Components'.

BMCCS was introduced in the villages with the MCC and MCC+FLIT centres. As this part of the programme was operated alike in both the treatments of the experiment, in MCC and MCC+FLIT, it will be described under single operative procedure for supervision, monitoring and infrastructure working.



The operation was carried out in two phases. The first phase was conducted during July 1973 to April 1974 and the second phase during April 1974 to February 1975 in two different sets of villages. The experiences of the two phases will be analysed together in the development of the field work. But the assessment of the ongoing programme will be based on data from the twelve villages of Phase II only. The data for analysis of the programme were obtained from service records and field observations by the Project Medical Officer.

### **Methodology**

Records were developed and maintained for the purpose of studying the status of the ongoing programme and to determine how far and how much it was possible to follow the plan. Since one of the mainstays in the field programme was empirical observations in place of other methods of collecting comprehensive data, the records that were developed were simple; the information was to flow from the village centre to the field office; and this information was 'gleaned observations' reported by village level workers, that is, the Maternity Assistant or the Health Educator. This factor was taken into consideration in developing the records. These records determined the content and the process of delivery of BMCCS.

Through a method of trial and error, the worker was able to report accurately, specifically and systematically, thus making possible a quantitative assessment of the programme. Field observations by the Project Medical Officer was a less formal procedure. These were collected with the objective of using them as instruction material for programme implementation. Hence, we are in a position to make a qualitative as well as quantitative presentation of the operation in this chapter.

### **Logistics**

The first phase of the project had two villages each for MCC and MCC+FLIT experiments in Jedcherla block of Mahbubnagar district. The second phase had six villages under each treatment of MCC and MCC+FLIT. They were distributed in four blocks of Atmakur, Jedcherla, Mahbubnagar and Wanaparathi. The nearest centre was 12 km, and farthest at 32 km, from the field

headquarters. As a Jeep was available at all times, the Medical Officer had no problem with regard to transport facilities for visiting the Centres.

Two villages were under the charge of one Maternity Assistant. The latter was the chief person responsible for delivering the BMCCS at the periphery. The experience of PHCs and Subcentres of the district indicated that if villages were more than 3 to 5 km away from the Centre, it made the visit of health personnel irregular and resulted in unsatisfactory delivery of services. In addition, periodic programming of supervisory visits often led to difficulties in the logistics of reaching the staff from the field to headquarters.

*Walkable Distance between Two Villages:* In order to overcome these two problems, it was decided that the two villages under the jurisdiction of the Maternity Assistant should be within a walkable distance of 3 to 5 km. The worker would stay in the first village (with the Health Educator) and be available for the first three days of the week, namely, Mondays, Tuesdays and Wednesdays, in that Centre. She would be in the second village and work there on Thursdays, Fridays and Saturdays, making night halts if necessary with the other Health Educator.

During Phase I, the distance criterion had to be waived in the case of one pair of villages due to certain considerations, such as receptivity to the programme and village cooperation. The two villages were located at a distance of 15 km, but a national highway was passing through them with adequate public transport facility. They were therefore chosen and the worker was given an allowance for travelling expenses in addition to her emoluments. One Health Educator resided in each of the villages as her major task was to conduct Non-formal Education classes and to distribute nutrition supplements.

### Personnel Problems

The medical services were to be delivered primarily by the Registered Nurse Midwife called the Maternity Assistant and assisted by the Auxiliary Nurse Midwife called the Health Educator. Both were residing in the villages. They were supervised and guided by a Project Medical Officer stationed at the field office.

The staff provision under Phase I consisted of one Medical Officer, two Maternity Assistants for the four villages and one Health Educator for each of the four villages. The required staff were



recruited and were in position for the entire period of the programme.

*Phase II Staffing Pattern:* In Phase II, the programme was to cover thrice the number of villages as in Phase I; it was, therefore, decided to provide an assistant to the Project Medical Officer at the field office. So the staffing pattern was: one Medical Officer, one Assistant to the Medical Officer (preferably a public health nurse), six Maternity Assistants and twelve Health Educators. The Medical Officer available in Phase I continued to serve for the entire Phase II period. Since a suitable public health nurse could not be obtained for the project, a registered nurse midwife was selected for the post. The requirement for registered nurses was thus seven.

The full strength of the staff was recruited at the commencement of Phase II but due to various reasons, a number of the registered nurse midwives working as Maternity Assistants dropped out before the end of the programme. The period of non-availability of Maternity Assistant varied 90 per cent of the time in one case, 50 per cent in two cases and 25 per cent in another case.

*Disincentives:* Although attempts were made to replenish the staff, this could not be done due to a shortage of registered nurses who were willing to live in villages. Three sets of interviews were conducted. No candidates appeared for interview twice when the place of interview was at Mahbubnagar. Thereafter, the heads of Nursing institutions were contacted and the interview was held at Hyderabad. The number of candidates reporting was poor. None among those interviewed were willing to join. They were afraid of living alone in the village and of shouldering the entire responsibility for clinical work. The short period of employment offered was another disincentive.

Since the project design was intended to test the viability of delegating medical care to a large extent in the hands of the peripheral worker to reach the village community, it was decided to recruit a registered nurse midwife as Maternity Assistant to be the principal operator of the programme of BMCCS. But during the first phase, as a matter of policy, it was decided to train auxiliary nurse midwives, the Health Educators, so that they could be substituted for the Maternity Assistants, if needed.

*Health Educator's New Role:* In view of this, the delivery of health and nutrition services did not suffer even though the Maternity Assistants were absent. There was enough evidence at the end of Phase I to show that the Health Educator was capable of taking up the programme operation. However, she needed more intensive



training and guidance in record-keeping. This was made good during the orientation training of the personnel prior to the field operation of Phase II.

The manpower constraint in the form of vacancies of Maternity Assistants which occurred in Phase II could have seriously jeopardised the programme but for the fact that the Health Educators functioning in respective villages stepped in to carry the programme of health and nutrition services. The Health Educator in some of the centres thus played the dual role of non-formal education teacher and basic health worker. This integrated, in some measure, the different components of the MCC activity with a single functionary at the village level.

### **Life in the Villages**

Why is there such universal unwillingness among the trained health personnel to work in rural areas? We shall answer this question by narrating some of our experiences in initiating the programme in the villages.

Out of the 19 staff members recruited, 14 were unmarried, three married, and two widowed. One of the requirements of the job was that both the Maternity Assistant and the Health Educator should reside in one of the villages. This raised the question of their common accommodation in the selected villages. Among the Maternity Assistants, five hailed from cities and two from villages while all the Health Educators were from villages. They were all recruited immediately after their formal training and this was their first appointment. The project authorities tried to secure living accommodation for them in the villages; as the appointment was for a short duration, they could not shift their families with them.

*The Marital Status:* When the villagers were approached, the first question we had to answer was about the caste and the marital status of the would-be tenant. This was a major determining factor while renting the house. In most places the accommodation was located at the periphery of the village. It lacked basic facilities such as privacy, toilet area, etc. Lastly, the villagers insisted that they should abide by the village custom under which drinking water could be drawn only from a specific well, often other than those close to their accommodation, as different wells were used by different communities.



The workers expressed their reluctance to live and work among villagers under such rigid traditions. This was however overcome by calling the village elders and women and having an informal talk with them and requesting them to provide some of the basic facilities. As far as possible, the accommodation secured served as a centre-cum-residence. In most of the villages two workers shared the accommodation.

*Worthwhile and Rewarding Experience:* What would have been the situation if the workers had to approach the village people independently? How would they be accepted and enabled to start and work independently and gain the esteem of the villagers for effective working? When questioned after she had been working in the area for some time, the worker replied that as a person, she was under the vigilant eye of the entire village community. Her acceptance depended on how she established her relationship with different members of the different communities and the manner in which she served each community as an individual and kept herself free from village factions. The workers indicated that the experience was worthwhile and despite their original apprehensions, the majority of them not only stayed but built up a good rapport with the villagers; and on the eve of their departure their work was greatly appreciated by the village people. They also felt that the supportive role played by the supervising staff had helped to make their work successful and rewarding.

### **Job Training**

Regarding the job training of the programme staff – the Maternity Assistants and the Health Educators – the Project authorities had to face equally novel problems. It is true the nurses and midwives had received formal training in health and medical care; but they had no prior experience in meeting the requirements of the job in a village. Also during their training in urban-based hospitals, they operated mechanically under orders without making any decisions for the treatment of even minor ailments. This resulted in very little functional ability to take up the responsibility of executing BMCCS independently at the village level.

The training was thus meant to prepare them to work independently and adopt new procedures to suit rural conditions without sacrificing scientific principles. Both pre-programme orientation and in-service training was given. The first phase was a training period both

for the trainee and for the supervisory staff, and was devoted to permit sufficient latitude for wide-ranging discussions about how to operate the programme. This was to enable us to understand what should form the take-off point for instituting the job training.

*Breakdown in Service Averted:* The experience proved that while the nurses had a vague idea of different concepts, such as antenatal care and domiciliary unit, they lacked specific knowledge. Further the information passed on to field office was incomplete and occasionally inaccurate. After the first two months of the programme, graded training with constant discussion of the problems between the Maternity Assistant and Medical Officer helped to formulate and prepare an Instruction Manual.

During this training the Health Educator, who is a trained Auxiliary Nurse Midwife was also included in the training course and instructed to attend to the health care in the absence of the Maternity Assistant. This was to help the ANM at later stages. This proved useful, when in Phase II four out of seven Maternity Assistants resigned, due to varied reasons, and the service could be offered uninterrupted in the same manner by allowing the Health Educator to step into the role of the Maternity Assistant. The breakdown in service which could have otherwise occurred in Phase II was thus averted.

### The Village Dai

More than one village *Dai* in each village had to be involved in the programme. Their individual experiences varied from being merely a refuse-remover to one actively helping during childbirth. This meant that training was to be at all levels. Supplying a kit to one or briefing lectures would be inadequate. So it was decided to train them all informally as close to their place of practice, by introducing the principles of safe delivery.

Before giving any training to the village *Dais*, it was essential to be seized of their traditional practices. This was done by direct observations during confinement, informal discussion about the attention given in different stages of labour and then drawing out the essential practices that can be easily changed. This was done by the Project Medical Officer and paramedical staff by interviewing the village *Dais* of different centres and by conducting some group interviews. Their responses indicated the following working pattern of the village *Dai*.



1. The village *Dai* was usually called at the time when active labour had set in, and more often late during the second stage of labour or at the end of the second stage.
2. The village *Dai* was responsible for separating the child after the expulsion of 'after-birth' by the mother.
3. She was to attend to bathing the baby.
4. She was to take care of the disposal of the 'after-birth'.
5. She normally had to give the mother her first bath after labour.
6. She washed all the soiled linen of the mother and the child for the first three days.
7. She attended to the mother and child for the first day or two, keeping awake in the night, massaging the mother's legs, etc.

### Traditional Practices

For any medical problem experienced during pregnancy or after delivery, medical aid was normally sought from the village *Vaid*. Only in complicated cases, the nearest hospital service was used. The preparation for confinement and practices followed during the conduct of a typical delivery in a village have been studied in depth by the Project staff in order to improve the standards of performance on scientific lines.

During the advanced stage of pregnancy a blanket, few rags of cloth, a piece of cloth to be used as head scarf for mother, a cap for tying round the child's head and a sickle are kept ready for use in a corner of the hut. The shelf opposite to the door-way of the hut is cleared and a lamp, to be lighted in case of emergency, is kept ready. The place near the hearth to provide a lying-in space for the mother is kept clean. When labour starts, the elderly women of the family or elderly women neighbours are called in to keep company of the woman in labour. When bearing down pains start the second stage of labour, the village *Dai* is called in.

*The Role of the Dai:* The woman during the first stage of the pains *squats*, with her back resting against the wall. The woman members and *Dai* hold her on both sides around the shoulder and encourage her to bear down. She is then made to lie down and continue bearing down to complete the expulsion of the baby by herself. The delivered baby then lies in position till the 'after-birth' is expelled. *The cord is never allowed to be severed till expulsion of the 'after-birth'.* The child's mouth, nose and eyes are not to be cleaned at this stage. A

tight twisted cloth is tied around the abdomen of the woman following the birth of the child to prevent the womb from receding to the upper part of the stomach. The weight of the child aids quick expulsion of 'after-birth'. If the 'after-birth' does not get expelled within 5 to 10 minutes, the woman's hair is rubbed against her tongue to induce retching and vomiting which in turn compresses the stomach and then the 'after-birth' is expelled. The *Dai* never attempts to internally interfere with the expulsion of 'after-birth'. In case of haemorrhage, nothing is usually done, being taken or normal bleeding.

When the 'after-birth' is expelled, the *Dai* takes the thread, which is to be used to tie the umbilical cord, kept tucked in her hair or hip. She applies a single tie close to the navel of the child and severs the cord with sickle with a clean single stroke. The severed end has no serration or irregular edge. She wipes the severed end of cord of the child, encloses it with a wrapper kept for the purpose. The cord wound is thus left without any bandage. She then wraps the child in a clean cloth and keeps the child aside.

*The Mother and the Child:* It is now for the *Dai* to remove the soiled and wet linen, wipe the mother dry and cover her up warmly. The head scarf is immediately tied around the head of the mother, taking care to close the ears. After settling the mother, she turns to the child and prepares for its bath. Hot water is used for cleaning purposes. After the bath is completed, oil is smeared all over the child's body. A cap is wrapped round the child's scalp to prevent a chill. Then the child is placed close to the mother.

The mother is given a bath within twelve hours after labour. Her diet, consisting of rice with pepper and dried ginger, is given following the bath. She is fed only once a day for the first five days. She is not allowed to drink any water for the first three days. The mother is made to inhale vapour of garlic and turmeric to avoid a chill. On the third day the child's abdomen is branded with a hot iron around the navel to ward off stomach trouble. The child is fed by a wet nurse till the third day and then given to the mother for regular nursing. The *Dai*'s responsibility ends here and she leaves the mother and child.

### Guidelines for Training the Village Dai

The village *Dais* are typically of very low economic status, invariably illiterate and of over 40 years of age. 'Training' therefore could only consist of informal discussions when the Project Medical Officer



visited the village, with the Maternity Assistant and Health Educators present. The following guidelines were evolved for training the village *Dai*:

1. Since the *Dai* is not called in during the first stage of labour, she was not given any instructions on antenatal assistance to the mother.
2. She was told that the sickle she used fairly handily was adequate if she would take care to see that the edges were sharp and even. She should check it as soon as she reaches the place and wash it thoroughly, especially around the handle where grains of sand may be embedded. After cleaning thoroughly, she should keep it in a vessel containing *boiling* water over the fire.
3. As she would be obtaining the thread to tie the severed end of cord from members of the house, she should place the thread also along with the sickle in the boiling water.
4. As soon as the child is born, she should clean the mouth and nose so that the child would cry lustily.
5. The next step would be to wipe the eyes with a washed wet cloth.
6. While she is waiting for the expulsion of the 'after-birth', she should drain off the thread and keep it near her.
7. As she is ready to sever the cord, she should wash her hands well and then handle the tie thread. When she is applying the thread she should see that the knot is firm. After severing the cord, she should not wipe the navel end with the edge of the soiled linen on which the child is lying to check the bleeding. She must wipe it with a washed and clean linen.
8. If the woman has *haemorrhage*, she *must send word for help* to arrest it as early as possible or take the woman to a nearby health centre.
9. The use of dirty oil over the raw cord wound of the child leads to 'seven day illness'. It is better not to apply anything but clean it and leave it dry.
10. Since experience has shown that the branding of the child's stomach did not solve the problem, she was asked to try and discontinue the practice.
11. As she is called upon for assistance by many in the village, she should try to learn the art and science of delivering safely by attending the training given in the P.H.C. in the area.

### Basic Health Services

The Maternity Assistants and Health Educators were posted by random selection of the selected villages for their assignment after their training period. We would now describe the technique, procedure and outcome of BMCCS in Phase II. The programme included six villages of MCC and six villages of MCC+FLIT treatment. The programme was conducted between April 1974 and February 1975.

*Beneficiaries Covered:* The population covered were the women with their children between 0 and 36 months to be included in the experiment for non-formal education classes or non-formal education with functional literacy classes in each village. According to the design of the study, there should have been 30 women with their children in the age-group of 0-36 months, with ten women in each group of pregnant, nursing and weaning category. Due to varied reasons detailed elsewhere, neither the enrolment nor the required attendance in each category group could be fulfilled. The beneficiaries for BMCCS were thus the enrolled participants at the initiation of action programme at the time of Bench Mark medical testing.

As the services were intended to basically cover ante-natal, intra-natal and post-natal women and infants and toddlers, the composition of participating beneficiaries and their characteristics were first considered. In describing the type of beneficiary of different categories, the following criteria were followed:

1. *Antenatal:* All the women who were in a state of pregnancy at the Bench Mark Survey as well as those of the sampled group who had become pregnant and needed care during the programme period were grouped as 'eligible for antenatal care'.
2. *Nursing and Weaning:* All the women who were in nursing and weaning stages through the entire period of the programme were grouped as 'eligible for nursing and weaning mother care'. This procedure had been adopted to avoid over-enumeration even though the possibility of an antenatal woman coming into this category was present.
3. *Infants:* All the child participants in the age of 0 and 11 months at the Bench Mark Survey and new born children entering the programme were accounted under infants.
4. *Toddlers:* All the children from 12 to 36 months of age at the time of the Bench Mark Survey were listed as toddlers.



The categorisation of participants has taken into consideration only the 'stabilised' participants, that is, those who attended at least 25 per cent of the classes. The composition of the participants receiving BMCCS by experimental treatments is given in Table I.

TABLE I: Composition of participants receiving BMCCS services by experimental treatment (Phase II)

S. No.	Item	MCC		MCC+FLIT	
		Women	Children	Women	Children
1.	Total Enrolment (BMMT)*	158	165	159	150
2.	Percentage Stabilised	86.1	80.6	86.1	80.0
3.	No. of infants (0-11 months age)	—	49	—	53
4.	No. of toddlers (12-36 months age)	—	84	—	67
5.	No. of women eligible for AN care	49	—	34	—
6.	No. of women eligible for Nursing/Weaning mother care	87	—	103	—

\*The sample indicated are all who underwent Bench Mark medical testing. This figure differs from other parts of the report as there had been a further dropout in the Resurvey.

Table I indicates that participation stabilised at about 86.1 per cent in both treatments. This was due to the policy laid down in the programme that only women who participated in education classes would be entitled to the benefits of health and nutritional care service. If the mother defaulted, her child also lost the benefit of the care. But for the enforcement of this rule the hypothesis of providing to one and the same mother an integrated package of education, nutrition and health would have been lost and it would have deteriorated as simply another health care unit.

### A New Forum for Health Education

The services were to be provided at the Centre, where consultation and medication for minor ailments, dispensation of drugs and routine procedures would be made available by the Maternity Assistant and in

her absence by Health Educator. The latter would then record the daily attendance in the 'Daily Diary' that was provided for under ambulatory care. The Project Medical Officer would visit each Centre once a fortnight. These visits were termed routine medical care visits to differentiate them from daily attention provided by the paramedical staff as well as the routine check-up examination conducted by her, called the preventive care procedure by the worker.

The routine medical care was mainly for periodic prophylactic attention, and only problem cases among ailments were attended by the doctor. As far as possible both the Maternity Assistant and Health Educator were present during the visit of the Medical Officer so that they can learn to diagnose and know the management of cases. Hence the routine medical visit served as an in-service training for her to learn treatments. She could then also exchange views as to how a particular treatment or method had helped the child to improve or what went wrong when an advice or treatment or method was not followed. It provided a forum for health education.

A check-up of all the beneficiary groups was done during the doctor's routine medical check-up. The importance of such examination, the systematic method of doing them, and the detection of deviation from health status was explained to the Maternity Assistants and Health Educators. The participants were told what to do under different conditions and circumstances. Children were weighed and their height measured once a month for children below 11 months and once in two months for children of age-group 12-36 months at the Centre. A clinical assessment of health and nutrition symptoms was undertaken by the Project Medical Officer. Where the ailment required attention at home or there was a lying-in person after delivery, a call was made at home and attention given. This was also recorded in the Daily Diary under the appropriate sections.

### **The Immunisation Programme**

The immunisation programme was carried out after obtaining the required vaccine or sera from the District Medical Officer's depot. The programme was implemented after the first four months. The list of children who were to receive the smallpox, D.P.T. and polio immunisation treatment was prepared by the Health Educator. The children were then examined by the Medical Officer and the programme for immunisation was drawn up. Primary vaccination was



given: the D.P.T. was administered in two doses; polio immunisation was given in three doses. As screening for primary lesion for tuberculosis was not possible, BCG was not included in the programme. However, the immunisation programme was only partially successful as objections were still voiced by elders who had much to say on child rearing.

Cases which required further investigation, elaborate treatment, or surgical intervention were referred and taken to places with better facilities such as Civil Headquarters Hospital or the Mission Hospital located in the Block.

### Analysis of the Three Major Categories of Services

Against the backdrop of the overall programme implementation presented above, the content of services and quantitative results can now be analysed.

The participants were to obtain their services through three major categories, namely, ambulatory service at the Centre, domiciliary service at home, and referrals to other health units. Each time a person obtained any type of service, this was recorded in the Daily Register. The total coverage and percentage distribution of services is presented in Table II.

TABLE II: Percentage distribution of attendance for Ambulatory, Domiciliary and Referral in MCC and MCC+FLIT Centres (Phase II)

S. No.	Type of service	MCC		MCC+FLIT	
		Women	Children	Women	Children
1.	Ambulatory service	97.6%	98.0%	97.8%	96.7%
2.	Domiciliary service	2.3	1.9	2.1	3.2
3.	Referral service	0.1	0.1	0.1	0.1
Total Observation*		17,743	16,178	20,331	15,268

\*Daily attended persons multiplied by days of attendance over the programme period in all six villages for each treatment.

*Individual Medical Care and Group Teaching:* Maximum observations and services were rendered at the Centre and the proportion of domiciliary was very small. Nearly 98 per cent of the health needs of

the children were attended to at the Centres. The referral services being minimal shows that MCC facility and the paramedical manpower available at the village could manage adequately most of the requirements of the community.

The important feature of Centre service utilisation is that the major portion of activity could be operated efficiently from one central unit which would provide time for individual medical care and also an opportunity for group teaching. This was mainly due to the fact the worker was nearly always available at the Centre as at least one Health Educator lives there.

*Eight Main Types of Service:* The services were rendered to two distinct groups as participants under the two categories – Women and Children; they are analysed separately. A total of eight main types of service under the Basic Maternal Services for Women were offered. Table III indicates the utilisation pattern in the MCC and MCC+FLIT centres.

TABLE III: Percentage distribution of types of service among women in MCC and MCC+FLIT Centres (Phase II)

Participating procedures	Antenatal women		Nursing women	
	MCC	MCC+FLIT	MCC	MCC+FLIT
Routine checks	25.4%	72.9%	23.9%	15.3%
Minor ailments	34.3	13.2	30.4	56.6
Nutritional illness	38.4	6.8	45.4	27.6
Toxaemias	0.0	0.0	0.0	0.0
Natal care	1.3	4.7	0.0	0.0
Immunisation	0.0	0.0	0.0	0.0
Family planning	0.4	1.2	0.0	0.0
Referral service	0.2	1.2	0.4	0.5
Total service contact (%)	100.0	100.0	100.0	100.0
Total service contact (No.)*	1,064	339	1,482	1,245

\*Total service contacts made to all participants during the entire programme period in all 12 villages.

Among the types of service the routine check-up was preventive care while ailment and nutritional illness were curative; the rest were supportive services. With the exception of women in antenatal group of MCC+FLIT, the curative services (for minor ailments and



nutritional illness) were in greater demand than the demand for preventive care: 73 per cent to 25.4 per cent in MCC antenatal women; 75.7 per cent to 24 per cent in MCC nursing women; and 85.2 per cent to 15 per cent in MCC+FLIT nursing women; this showed that there was a far greater demand for curative services than for preventive services. The supportive care were still less utilised than preventive, in that it records only 21 and 6 per cent respectively among antenatal women in MCC, MCC+FLIT with 0.4 and 0.5 per cent in nursing women of MCC, MCC+FLIT. The complete absence of cases in Toxaemia indicates that the antenatal care was effective, while the low referral service shows that the services were adequate to meet the felt needs. The immunisation programme could not be implemented owing to procurement difficulties in the case of the needed vaccines. The absence of cases in immunisation was due to the fact that the service was not being implemented in the programme for women due to certain procurement difficulties.

### **Negative Attitude towards Family Planning**

The response to family planning registering 0.4 per cent and 1.2 per cent in both treatments denotes a deep-rooted negative attitude towards family planning methods. The few requests were entirely for the permanent method of sterilisation. The problems of those who opted for family planning required more attention, but this could not be undertaken in depth due to the short period of the programme and other activities.

As the major category of beneficiaries of the services was currently pregnant women, antenatal and intranatal care and outcome of terminating pregnancies is elaborated here. Antenatal services were instituted among all the women who were in an advanced state of pregnancy at the time of enrolment. There were 14 women in MCC and 19 in MCC+FLIT in April 1974. All the women in MCC and 17 women in MCC+FLIT delivered at term in the respective villages. Two of the women in MCC+FLIT had migrated to their parents' village during the early part of the programme and the outcome was not known.

Among the 14 pregnant women in MCC, there was one still-birth as a result of accidental fall of the mother, leading to ante-partum haemorrhage and the rest had normal deliveries. In the case of a new born infant, the custom among people in these villages is to brand the

stomach of the child on the third day after birth with two lines on each side of the navel. This is believed to prevent the child from developing stomach disorders. This practice had led to the loss of one infant on the seventh day due to abdominal cellulitis and septicemia. Thus among 14 cases in the MCC, one case resulted in a perinatal death and the other a neonatal death. All the deliveries conducted among MCC+FLIT terminated naturally at term without any foetal loss.

### Periodic Check-ups

In addition to the above, periodic check-up of nursing and weaning mothers had led to the detection of 32 pregnancies in the MCC and 15 pregnancies in MCC+FLIT. These women had the advantage of having care from the first trimester of pregnancy.

A total of 427 antenatal checks in MCC and 247 in MCC+FLIT centres were conducted during the programme with a mean of 3 checks in MCC and 4 in MCC+FLIT for each pregnant woman. About 270 eligible pregnant mothers availed themselves of this service out of 309 in MCC and 147 out of 168 in MCC+FLIT centres. Among nursing and weaning mothers, 354 of 422 in MCC and 361 of 462 mothers in joint centres availed of the routine check-up.

Children were attended to through five types of service in the BMCCS. The children were classified into two categories: infants 0-11 months of age, taking the completed month into account, and toddlers 12-36 months.

TABLE IV: Percentage distribution of types of service among children in MCC and MCC+FLIT Centres (Phase II)

Participating procedures	Infants		Toddlers	
	MCC	MCC+FLIT	MCC	MCC+FLIT
Routine checks	18.3%	35.6%	4.5%	12.2%
Minor ailments	59.8	30.2	52.6	35.6
Nutritional illnesses	20.6	31.7	38.9	43.0
Immunisation	1.2	2.4	3.8	8.9
Referral service	0.1	1.0	0.1	0.2
Total service contact (%)	100.0	100.0	100.0	100.0
Total service contact (No.)*	902	574	3,351	1,712

\*Total number of all the service contacts made for all participants during the entire programme period in 12 villages.



### Pattern of Utilisation

Table IV gives the pattern of utilisation and indicates clearly that curative service in terms of treatment of minor ailments and nutritional deficiency-based illnesses combined had preponderance over the other services: among infants it was 80.4 per cent and among toddlers it was 91.5 per cent of all services in MCC Centres and 61.9 and 78.6 per cent for infants and toddlers respectively in MCC+FLIT Centres. The preventive treatment in MCC and FLIT however produced better results than MCC, with low figure of utilisation of curative services. The routine check which was preventive and promotive health care was least utilised among the toddlers of MCC (4.5%) and substantially used among the MCC+FLIT infants (35.6%). This feature indicates that in terms of prophylactic services, the joint centre achieved better results which may be attributed to the management of this group. In terms of immunisation, the utilisation was higher among toddlers (3.8%) and (8.9%) to that of 1.2 and 2.4 per cent in MCC and MCC+FLIT respectively.

The utilisation of services among children has clearly brought out that preventive, promotive and prophylactic measures had greater response in MCC+FLIT village Centres than the MCC villages. Credit for this may be attributed to the field personnel's individual ability.

### Pattern of Morbidity and Treatment

Having considered the utilisation by different types of beneficiaries, the pattern of morbidity encountered in the area is now described. The preliminary analysis under two treatments showed the pattern to be alike for women as one category and children as the other. The reporting has taken this into consideration and will present the reported illnesses for both treatments together under Women and Children and the total community served.

Table V showing clinical conditions is self-explanatory, except for the last category of 'Ill-defined conditions'. This classification included vague aches and pains, headache, fevers of unknown origin and general malaise.

The overall picture of clinical symptoms manifested in the order of pregnancy of occurrence was, nutritional deficiency diseases (40.3%), respiratory conditions (19.4%), alimentary troubles (17.1%), ill-defined

TABLE V: Proportion of clinical conditions among 6,939 reported illnesses by women and children (Phase II)

Clinical conditions reported	Women	Children	Total
1. Diseases of alimentary system			
(a) Dysentery diarrhoeal diseases	8.7%	13.6%	11.7%
(b) Other diseases of digestive tract	9.0	3.1	5.4
2. Diseases of respiratory system	17.9	20.3	19.4
3. Diseases of eye and ear	2.7	6.9	5.3
4. Diseases of skin	5.1	6.1	5.7
5. Nutritional deficiencies			
(a) Iron deficiency	21.5	12.9	16.2
(b) Vitamin, protein, calorie deficiency	12.4	31.5	24.1
6. Diseases of genito-urinary system	3.5	0.0	1.4
7. Measles	0.1	0.3	0.2
8. Malaria	2.2	0.0	0.9
9. Ill-defined conditions	16.5	5.3	9.6
10. Abortions	0.4	N.A.	0.1
Total Conditions (%)	100.0	100.0	100.0
Total Conditions (No.)*	2,684	4,255	6,939

\*Total number of clinical conditions observed among all the reporting participants for the entire programme period in all the 12 villages.

conditions (9.6%), infection of skin (5.7%), eye and ear (5.3%). The incidence of malaria and measles, even though small, had to be dealt with adequately to prevent post-illness morbidity. The abortions encountered were mainly threatened abortions; and with the exception of two, others carried their pregnancy to term.

*Chronic Under-nourishment:* It was found that the major problem of women was iron deficiency (21.5%) followed by respiratory diseases (17.9%). The results indicated that the underlying problem was one of chronic under-nourishment.

In case of children, the clinical picture is that of P.C.M. (Protein-Calorie Malnutrition) malnourishment (31.5%). The high incidence of respiratory illness (20.3%) as well as diarrhoeal diseases (13.6%) was also mainly due to under-nourishment. In this connection a few field observations of the concept of child-rearing need to be considered.

The respiratory illnesses and diarrhoeal diseases were believed to be due to the influence of mother's diet on the breast-fed child. Whenever the ailment occurred below the age of six months, the child was given



a herbal purgative in respiratory illnesses and was semi-starved in diarrhoeal conditions. Seeds of *cassia fistula* were tied around the neck. Inhalation of turmeric and paste of the same applied on the head was the line of treatment. This led an ordinary upper respiratory condition to progress into a state of lower tract infection or bronchitis. As a result, the illness was prolonged. Feeds were insufficient. The natural demand for higher protein requirement due to infection coupled with the protein requirement for growth during this period resulted in under-nourishment.

*Recurrent Infections:* The cases of diarrhoeal diseases called for a different kind of management. The frequency of bowel movement was invariably a result of hunger diarrhoea, as the feeding was restricted. The children were not accustomed to sips of water up to eight or nine months, as the breast feed was supposed to satisfy both the hunger and the thirst. This posed a special problem for administering fluid when infantal diarrhoea set in. In older children the onset was due to poor sanitary conditions, contamination of food and malnourishment as such. The amenability of condition to treatment was jeopardised by exposure to recurrent infections. This single cause of morbidity often led to a great set-back, especially among the toddlers, leading to severe protein-calorie malnutrition.

The method of management of illness was to evolve a system of recognising the illness pattern of the area, watch out for the risk condition of individual clinical status, and institute early, adequate treatment. This was done by orienting the Maternity Assistant and the Health Educator in the recognition of not only illnesses but specifically the signs of respiratory distress, dehydration, allergic reaction and shock. Standing orders classifying symptoms and associated signs, which she could identify, were recorded and given. The drugs and instructions for their usage were provided.

*Curative Care:* The management of curative care by the Maternity Assistant and Health Educator is considered next and given under the heading Minor Ailment and Nutritional Deficiency in Table VI for the two treatments separately.

An analysis of the total number of beneficiaries who attended the Centres shows that the medication of nutritional deficiencies took up most of the time of our paramedical staff. The medication of minor ailments of children and women was the next most important time-consuming job. The consultation-medication ratio which is an index of therapeutic management registering 1.2 for both minor ailments in

TABLE VI: Mean days of consultation and medication per month for two curative services by treatment (Phase II)

Item		Minor ailments		Nutritional deficiency	
		Women	Children	Women	Children
1. Consultation	MCC	2.4	4.1	2.5	2.7
	MCC+FLIT	2.1	2.7	2.5	2.2
2. Medication	MCC	4.7	9.8	19.8	20.7
	MCC+FLIT	4.8	6.6	22.6	20.7
3. Consultation	MCC	1.2	1.2	1.8	1.9
Medication	MCC+FLIT	1.2	1.2	1.8	1.9
Total Beneficiary attendance*		821	776	626	738

\*The total attendance for the programme period reported as total number of beneficiaries.

both the experimental groups indicates a good approach. The low consultation to medication figures made it clear that minor ailments were treated adequately. The higher ratio for nutritional deficiencies was due to, environmentally, a low level of vitality of the community.

*Internal Referral Service:* Another reflection on management is referral indices. There were two kinds of referral service adopted. One was internal, which was advice and guidance between the paramedical auxiliary and the medical officer, the other the utilisation of extra services beyond the capacity of village centre. As stated earlier, the medical care was to a large extent delegated to the Maternity Assistant/Health Educator adapting it to an intermediary medical technology. It automatically led to a greater responsibility for the paramedical staff, referring only the problem cases to the Medical Officer. This served a double purpose in that she had medical support that is essential for her background of training and also it relieved the Medical Officer from being overloaded with routine cases.

### How the Burden was Shared

The proportion of cases attended by medical officer to that of cases attended by other members of the team is given in Table VII.

Table VII shows that the largest patient burden was borne by the two functionaries: the Health Educator (58%) and the Maternity



TABLE VII: Percentage distribution of number of persons served by the health personnel

S.No.	Functionary	Served Clientele
1.	Medical Officer	8.0%
2.	Maternity Assistant	34.0%
3.	Health Educator	58.0%
	Total Clientele (No.)*	78,697

\*Cumulative total of all participants attending the BMCCS for the total programme period in the 12 villages.

Assistant (34%). This fulfils the objective as envisaged in the plan that the lowest skilled member should be responsible for the major part of the community medical services. The low internal referral service of 8.0 per cent to the doctor and the consultation-medication for minor ailment as 1 : 2 with bulk of community receiving service from the Health Educator and the Maternity Assistant has proved the feasibility of delegating the medical care to paramedical staff located in villages in terms of quantity and quality of care.

*External Referral Service:* The health care provided under the MCC treatment was clearly stated to be only a basic service. One can come to the conclusion that some form of medical care is perhaps so diluted that it may be thought of as an excuse for total absence of service. But the results so far presented clearly indicate that the BMCCS was an effective basic service within its limited parameter. In order to make care comprehensive, it had to resort to utilisation of better endowed service units outside the Centre and this provision under the project was known as external referral service. The external referral units were Civil Headquarter's Hospital and the Mission Hospital located in Jedcherla block.

The referral services were meant for two major purposes. They were: (1) for further investigation, and (2) in-patient care. A total of 23 women and 18 children were referred; 19 cases among the women and 18 cases of children were sent to the Civil Headquarter's Hospital, two cases of women each were sent to the PHC and the Mission Hospital respectively.

Among the women, the purpose of reference were tubal ligations (8), surgical treatment (7), medical treatment with hospitalisation (3), and further investigation (5). With regard to children, 8 cases were for

treatment of dehydration, 4 for acute respiratory distress, 2 cases of burns, and 4 for investigations. Thus, out of 41 cases, 9 were for investigations and 32 needed in-patient care with elaborate services. In total service input, even though external referral service is very small, it is still an essential part of the service in that it provides a comprehensive care, thus fulfilling the felt medical need of the community.

### Nutrition Component of MCC

The Problem Survey as well as the clinical assessment at the bench mark level of the programme indicated that under-nourishment and malnutrition figured as the dominant feature of morbidity. The need to supplement the diet of women and children is recognised at all levels but in implementation, the choice of food supplements is extremely difficult. To be effective, the food supplement should be formulated to bridge the lack of nutrient in the existing habitual diets. The information available particularly on child's diet at the younger ages was negligible.

Further, even the available information is a proportionate calculation drawn from computing data on family diet, using coefficients with adult man as one consumption unit. It also assumes that within a family the distribution occurs according to physiological needs. The fact is that socially this need not be so. This led to the necessity for getting first-hand information on diets as a prerequisite for initiating the feeding programme. This became an elaborate venture and could not be completed before the implementation of the programme.

*The Food Supplements:* In view of the circumstances described above, the major part of the feeding was done by obtaining recommended supplementary food and advocating the better use of local foods in the nutrition education and demonstration programme. The food supplements were obtained from CARE through Andhra Pradesh Government. The articles obtained were *balahar* and Salad Oil. The ration for the beneficiary was as follows:

1. <i>Balahar</i>	Mother	:	198 gm
	Child	:	99 gm
2. Salad Oil	Mother	:	42.7 gm
	Child	:	7.1 gm

The total calorie equivalent was 1,089 for the mother and 418 for



the child and the quantity of protein received was 45.5 gm for the mother and 22.3 gm for the child. The supplementary food provided 52 per cent of the calorie needs of the mother and 35 per cent of the calorie needs of the child.

*'Take Home System'*: The delivery of the supplementary food was by a 'take home system'. The Health Educator distributed the allotted ration to the mother who attended that day's classes, along with a ration for her child if it was included in the programme. The distribution was undertaken after the education class and dispensation of health service as the *last* activity of the MCC programme each day.

The participation in the supplementary feeding solely depended on the regularity with which the mother attended the entire MCC activity. This again ensured that the package of services were offered only to the mother who participated in the education, health and nutritional care as a package deal.

A variety of preparation suited to the local tastes and modes of cooking were demonstrated along with the supplements and by using local foods to substitute *balahar*.

TABLE VIII: Participation in supplementary feeding programme in MCC and MCC+FLIT (Phase II)

Item	MCC		MCC+FLIT	
	Women	Children	Women	Children
Availment	87.6%	78.8%	88.8%	79.5%
Days of utilisation	64.3%	53.5%	70.2%	63.6%

As shown in Table VIII, the availment was lower among children in both the treatments. This was mainly due to the fact that experimentation with new foods in place of habituated diets particularly for children was always accepted cautiously by the rural community. This feature is more clearly brought out when days of utilisation are taken into account as indicated by 53.5 per cent in MCC and 63.6 per cent in MCC+FLIT centres. Comparing the two treatments across the availment as well as utilisation for both types of beneficiaries, participation is found to be marginally higher in MCC+FLIT, in tune with the entire service programme observed in the earlier part of the chapter.

**Did the Target Group Receive the Ration?**

The overall high percentage of availment indicates that the system of delivery was satisfactory as far as distribution was concerned. The real problem as to whether the food obtained reached the specific beneficiary in terms of the allotted amount or whether the food formed a substitute still remains to be answered adequately. But the Maternity Assistant or Health Educator visited the house periodically to encourage the mother to use the foods for the stipulated beneficiaries only. According to field observation, the beneficiaries did get the supplement but received only a part of the allotted ration. Hence for practical purposes one could take it that half of the supplement was utilised by the specific target group.

In propagating the use of local foods, the main stress was laid on weaning foods for children. Use of greens and pulses was stressed as they were available in the region and it was within their economic reach. The better animal protein foods were scarcely available and could not be promoted as they were beyond the reach of lower economic groups.



**Part IV**

**RESEARCH EVALUATION AND MONITORING**

## PREPARATION OF THE SCHEDULES

Victor Jesudason

Phase I Surveys: Bench Mark Survey Schedule; Prior Research; The Basic Areas of the Study; Eliciting Information on Pregnancy Histories — The Mechanics of Questionnaire Construction: Objectives of the Pretest; Pretest Procedures — Some Problems: Zero Scoring and Colloquial Telugu — Clinical Assessment of Health and Nutritional Status of Mother and Children — The Literacy Test: Concept of Literacy; Operational Definition — Constructing a Test of Literacy Skill: Content of the Test; Validation of the Test; Some Limitations of the Test — Revised Literacy Test; Validation of the Revised Test — Phase II Surveys — Post-Survey Schedule.

### *Abstract*

In this chapter, the procedures adopted for preparing, pretesting and finalising the questionnaire of the Bench Mark and post-surveys of both the Phases I and II are described. The questionnaire was structured to have five parts. They were: (a) the main schedule which gathered information of socio-economic status, demographic characteristics, knowledge, attitude and practice in the areas of health, nutrition and family planning, and supplementary and global measures of change; (b) clinical assessment of health and nutritional status of mothers and children; (c) measure of literacy skills; (d) measures of psychomotor development of children; and (e) assessment of cognitive structure of women (for Phase I only). This chapter deals with the first three parts of the schedule only.

### PHASE I SURVEYS

#### **Bench Mark Survey Schedule**

DURING NOVEMBER-DECEMBER of 1972, much of the work relating to the preparation of the main Bench Mark schedule was undertaken.

*Prior Research:* Prior studies carried out in maternal child health, especially in the Telengana area, were consulted. These earlier studies gave us an insight into the socio-economic and health conditions of



the target area and helped in framing the question format and the precoded categories to be used in this study. Two of the more important studies that were consulted are: Dube (1967) and Muthayya (1973).

Two problem surveys had been conducted earlier in the study area. In these two studies, the open-ended questionnaire format was used. The answers to the questions were recorded *verbatim*. These answers were content-analysed to yield categories of answers. The categories that were developed gave clues to the type of responses that could profitably be used in the Bench Mark Survey schedule. In addition, the dietary food habits survey carried out in the study area also furnished information about food habits, taboos and food consumption patterns.

The major objective of the Bench Mark Survey schedule was to provide baseline measures to document the changes that had taken place due to the educational programmes of the project. The schedule had to be closely related to the curriculum content of the non-formal education classes. Some of the major themes in the areas of nutrition, maternal and child health and family planning were selected and rephrased as questions.

*The Basic Areas of the Study:* The basic assumption of the study was that an integrated programme of education with basic maternal and child health and nutrition services would result in lasting benefits and have a favourable impact on the welfare of the society. 'Lasting benefits' is a global concept and it was only the specific combinations and mix of the study design which transformed this global concept into a viable experiment.

The lasting benefits to be imparted are in the areas of literacy, maternal health, child health, nutrition, and family planning. Within each of these five areas, three classes of lasting benefits can be analytically delineated. First, some benefits are specifically related to the immediate objectives that are present in the treatments (or 'criterion' referenced). Second, some benefits are due to transfer of learning and not directly related to what actually happens in the programme (or 'supplementary'). Lastly, some benefits are due to wider aspects of change due to participation in the programme (or 'global'). Cross-classifying the five areas and the three classes of benefits yielded 15 categories as shown in the table (see page 143).

It was thought that the questionnaire should contain questions on all these 15 categories.

*Eliciting Information on Pregnancy Histories:* The guiding

Areas	Measures of classes of lasting benefit		
	Criterion	Supplementary	Global
1. Functional literacy	A	F	K
2. Maternal health	B	G	L
3. Child health	C	H	M
4. Nutrition	D	I	N
5. Family planning	E	J	O

concern of the study was to reduce mortality and morbidity among rural women and children. The major task of the study was, therefore, to document as accurately as possible the changes that had taken place with regard to mortality and morbidity. To achieve this, reliable information on pregnancy histories had to be gathered. Data gathered from rural women, especially illiterate women, often reflect an under-estimation of the number of pregnancies and foetal and child wastage (United Nations, 1962). So, this called for great care and efficient planning. Over the past few years the Council for Social Development had carried out several studies wherein pregnancy histories were collected in a systematic manner. Each of those studies built upon the experience of earlier studies had worked out 'better' methods for eliciting data. These as well as a few others (e.g. United Nations, 1962) where pregnancy history had been systematically elicited were consulted. Some of the concerned researchers were also consulted, especially for their wisdom of the hind-sight. Based on all these, a simple and comprehensive method to elicit information on pregnancy history was evolved.

Obviously, questions on pregnancies could not be framed like other questions. It was felt that the respondents should be taken into confidence and encouraged to recall all their pregnancies. A preamble stating the major objectives of the study and the need for accurate data was prepared appealing to the respondents to make an extra effort to recall all their pregnancies. This preamble to the pregnancy history was incorporated into the schedule and explained to the respondents.

### **The Mechanics of Questionnaire Construction**

As the first step, a working paper was prepared and circulated among



the various experts and working staff connected with the study for their comments and suggestions. This exercise helped further to sharpen the concepts on which the experiment was based.

On the basis of this feedback and further discussions, typed copies of this questionnaire were circulated among the different people connected with the study. The questionnaire was suitably modified in the light of the reactions received from them. A Telugu version of the approved questionnaire was mimeographed and was pretested during 12-19 February, 1973.

*Objectives of the Pretest:* Three main objectives guided the pretest and procedure adopted for finalisation of the schedule. First, the questions were to be worded in such a manner that they could be readily and correctly understood by all respondents. The wording of the questions was to be easy and in a conversational style and not necessarily phrased in the 'best' and correct grammatical Telugu. Second, the order of the questions would be such that they would 'flow' from one section to another naturally and easily as in a conversation. Finally, the interview form would be so constructed as to command a high level of co-operation. In other words, the questions would not talk down to the respondents or raise doubts about their veracity.

*Pretest Procedures:* As a part of their training, the investigators carried out the pretest survey using the mimeographed schedule. Each investigator canvassed about 12 interviews. Seventy schedules thus completed were item-analysed. After each day of interviewing, the investigators' reactions to specific questions and problems they encountered in canvassing questions were gathered. Further, the observations of resource persons in the field when the questionnaires were canvassed were also pooled.

Instructions to investigators for canvassing and coding the schedule were made as complete as possible. A format of the questionnaire that could easily differentiate instructions from questions (using block letters, indentations, italics, underlines, etc.) was worked out and adopted. A few questions that failed to differentiate clearly from the point of view of the respondents or were beyond their comprehension were deleted. Complicated questions were broken down to their components. A logical sequence and flow was adopted and a few questions that elicited vague responses were reworded to elicit definite answers. Finally, more codes were provided for questions for which the response codes were found to be inadequate. The finalised question-



naire was again discussed with the investigators.

Before sending the questionnaire to the printer, instructions with regard to size and quality of paper, width of margins, size for boxes for coding, spacing between questions, and space required for answers were worked out and written down. This was explained to the printer before the schedule was set in type.

### Some Problems

In preparing the schedule and getting it ready for the Bench Mark Survey, a number of problems were encountered. Two of them are worth noting here.

*Zero Scoring and Colloquial Telugu:* A large number of questions were based on the curriculum content of the non-formal education classes. They were, therefore, structured in a manner that the respondents would generally score zero at the Bench Mark Survey and would probably score higher during the post-test period. Nearly all the investigators had some experience in conducting conventional sample surveys. In such surveys the questions are structured to obtain a distribution of respondents over different levels of a scale. During the pretest, most of the respondents scored zero for those questions dealing with the experimental treatment. So the general complaint from the investigators was that the questions were not 'working'. Repeatedly the purpose of the study and the need for such questions had to be recalled. In terms of revision and finalisation of the questions a great deal of care and probing was required to distinguish between those questions that actually were not 'working' and questions that were only perceived as 'not working'.

In order to ensure standardised data collection procedures, the Telugu translations were cast in the colloquial Mulki Telugu. When the version was taken to the printer, the manager of the printing press started correcting the stylistic and grammatical 'errors'. When we insisted that the schedule was to be printed as we had given it, he did not want to bring down the prestige of his press by printing such colloquial Telugu. After explaining to him the purpose of the schedule and the importance of the conversational form for survey research, though still sceptical, he agreed to print it in the manner we wanted.



### **Clinical Assessment of Health and Nutritional Status of Mother and Children**

The object of this part of the study was to gather accurate and standardised information on the frequency distribution, and effects of illness and disability of the people in the study as well as the manner in which they are attended to. Illness and disability are of two types. Some cannot be easily diagnosed; they are non-manifest diseases which can only be detected by trained personnel or through laboratory tests and physical examination. Some others are encountered in the day-to-day life and the respondent herself may handle them in the course of her normal life. Consequently, two entirely different sources were utilised to collect data. They were: first, the people themselves, by means of direct interviews; second, clinical tests, measurements and physical examination.

It is also obvious that each of the two sources provides information which cannot be usually obtained from the other. The interview is the best source for comprehensive statistics on disability, days in bed, morbidity, injury or illnesses of minor nature, how they were handled, and use of medical facilities. Such questions were included in the main Bench Mark schedule. The direct examinations by trained medical personnel coupled with clinical tests and measurements were the only source of diagnostic data regarding difficult-to-recognise and untreated diseases. Specifying these objectives, the concepts that should be measured and their operational definitions, a working paper was written up. This paper was circulated among the various people associated with the study and their reactions were obtained.

Researches conducted in India in the area of maternal and child health were consulted (e.g. Khanna Study, Narangwal Study and the Indo-Dutch Project). Their records of health and nutritional status were closely examined for use in this study. Although much insight into the concepts and their operational definition were gained by this, those records could not be directly used in this study. The data contained in these records could not be directly punched on to IBM cards so that they could be read by a computer. The records were not structured in such a way as to make them readable through machine. In this study, it was decided that the records would be so structured that they could be directly put on IBM cards without the intermediate step of recoding the data. A directly transferable format would reduce errors that would creep into the process of recoding. So a set of

records for measuring the health and nutritional status of mother and children was devised. These records and forms were not and *could not* be pretested. Since they were not pretested, the drawbacks of the records were not known before their use in the field. (The difficulties encountered are discussed below when the data are presented.)

### The Literacy Test

The purpose of the literacy test was to measure the achievement of the women in literacy skill. As an illiterate woman was defined as one with three years or less of formal schooling, it was found that a few women in the study had already acquired rudimentary skills in reading and writing. In order to document the change or increase in literacy skills of these people, it was decided to administer the test both before and after the experimental manipulation. In addition, it was also decided to administer the literacy test to the women in Control and MCC treatments where no literacy classes were to be conducted.

*Concept of Literacy:* It is, indeed, not easy to achieve a satisfactory definition of the concept of literacy. But a working definition was needed to facilitate and guide the development of a test of literacy. Towards this end, a working definition has been attempted. Conceptually, literacy is a skill by which an individual is able to express or code his thoughts into visual symbols which could be easily understood by others and also to decode the symbols of others' thoughts. In popular parlance, it is the skill or ability to write and read.

*Operational Definition:* The objectives and study populations of a study and the varying demands of different cultures and subcultures determine the operational definition of the concept of literacy. For example, in the US Census, literacy is defined as equivalent to the completion of six grades of schooling. For the US Vital and Health Statistics Surveys, it is defined as 'that level of achievement which is attained by the average child at the beginning of the fourth grade' (Donlow *et al.*, 1968 : 2). In other words, within the same framework of national surveys in the US one set of surveys defines literacy as the equivalent of the sixth grade and the other as the level attained at the beginning of the fourth grade.

The operational definition of literacy in the Indian Census has changed over the censuses. In the Census of 1941, literacy was defined as 'the ability to read a letter and write the answer' (Census of



India, 1941 : 31). The 1951 Census added ability to read a simple letter 'either in print or in manuscript' (Census of India, 1951 : 7). In the Census of 1961 the test for reading was to 'read one of the examples in the enumerator's Handbook with facility' and the test for writing was 'the ability to write a simple letter' (Census of India, 1961 : 92). In a study which measured retention of literacy, Roy and Kapoor (1975 : 6) defined literacy not only as a working knowledge in reading and writing but also in arithmetic.

For the purposes of this study, literacy is defined as the ability to make use of skills in reading, writing and simple arithmetic. The term 'make use of' connotes that education is an instrument for development. In other words, 'the purpose of education must be to rationalize attitude as well as to impart knowledge and skills' (Myrdal, 1968 : 1621).

### **Constructing A Test of Literacy Skill**

The problems faced and the considerations which had to be taken into account while constructing the Literacy Test are listed below:

First, one of the major objectives of the study was to impart functional literacy to pregnant, lactating and weaning mothers in rural areas. So, the items in the test should be relevant to these areas of maternal and child health and nutrition. Functional literacy should equip these women with the ability to read and write so that they can effectively face their day-to-day problems.

Second, the literacy test was intended to be a part of a much larger procedure to evaluate knowledge, attitude and practice in the areas of maternal and child care. The duration of the literacy test should necessarily be brief. The target time of 10 to 15 minutes for the duration of the test was thus established.

Third, the literacy test meant for children also measures the extent of vocabulary known to them. But in the case of adult women who already possess a wide range of vocabulary, the extent of vocabulary known to them need not be measured.

Fourth, the writing component of a literacy test has the choice of opting for a dictation or transcription test. Past research has shown that when the target population was adults, respondents felt embarrassed when they were given dictation (Roy and Kapoor, 1975). It was, therefore, decided to follow the transcription method instead of dictation.



Fifth, it was assumed that the rural population may make more use of their reading skills rather than their writing skills. Consequently, it was decided to include more items on reading ability than on writing ability.

Sixth, as a corollary to this, it was assumed that the target population may read printed matter more *often* than hand-written materials. It was therefore decided to include only printed matter in the test and discard the hand-written material.

Seventh, since the target population of this study will be neo-literates, it was decided to present the letters and words in a format (i.e. size and shape) with which they were familiar. This meant that the schedule had to be printed in the same type in which the primer had been printed.

Finally, as the major concern of the test was to measure the level of literacy skill and not to classify the respondents into literates and non-illiterates, a suitable coding procedure was followed. If a person answered (i.e. read or wrote) an item (i.e. a letter or word) correctly, she received a score of one for that item and zero if she answered it incorrectly. All blank or 'don't know' responses were treated as incorrect answers and were assigned zero scores. Thus, the scores obtained by an individual could be summed up and reported as her reading achievement score, writing achievement score, arithmetic achievement score and total 3-R achievement score.

*Content of the Test:* The test had three sections. They were: (a) Reading test, (b) Writing test, and (c) Arithmetic test. Each section had two parts, namely straight reading or writing and comprehension. The items in each part were arranged in order of difficulty. This implies that an individual who could not answer correctly a lower numbered item, in general, could not answer correctly a higher numbered item.

To illustrate, the reading test begins with vowels, then moves on to simple consonants, complex consonants, two letter words, three letter words, four letter words and complex words with double consonants. This is followed by a brief passage which is to be read by the respondent and then she is to answer the questions based on it. The letters and words taken from the primer, covering the entire primer. Since the primer contained themes dealing with maternal and child health and nutrition, most of the words in the test dealt with these functional themes.

*Validation of the Test:* The definition of literacy which guided the



test construction emphasised the functional aspect of literacy. The functional definition stresses an individual's ability to function in a society. But to understand and evaluate the achievement of respondents, a normative definition may be useful. Normative definitions stress some typical level of educational attainment. So the literacy test was first administered to children in rural schools in this area. Table I gives the mean level of achievement of the rural children. By comparing the achievement of a respondent with the mean achievement of children in these grades, one can determine the normative achievement of that respondent.

TABLE I: Means and standard deviations of achievement in literacy skills of selected rural school children in Mahbubnagar district

Grade in school		Reading achievement	Writing achievement	Arithmetic achievement	Total 3-R achievement
		Max=45	Max=33	Max=40	Max=118
Second	$\bar{X}$	20.05	11.53	13.95	45.53
(N=19)	SD	(11.20)	(4.96)	(5.33)	(17.47)
Third	$\bar{X}$	26.84	16.37	22.84	66.05
(N=19)	SD	(10.83)	(3.80)	(8.00)	(18.54)
Fourth	$\bar{X}$	32.83	20.11	27.83	78.65
(N=18)	SD	(11.07)	(4.20)	(7.13)	(18.67)
Fifth	$\bar{X}$	35.00	21.95	29.00	82.90
(N=19)	SD	(10.87)	(5.38)	(9.39)	(21.38)

*Some Limitations of the Test:* First, it may be recalled that the test was constructed and administered before the classes were begun. While constructing the test, even the primer was not ready. When the classes started, as a result of experience in Phase I, some of the letters and words (which were also present in the test) were modified or de-emphasised. Since the same test had to be used both for the Bench Mark and the post-survey, the test could not be modified suitably.

Second, the data provided in Table I indicate that the mean achievement of grade 5 students were at the 50 per cent level of the test. In addition, only one student (out of 19) in grade 5 achieved the maximum score. This indicates that the test discriminates better at the upper end of achievement rather than at the lower end of literacy skill. Perhaps, for neo-literates, the test should discriminate better at the lower end rather than at the upper end.

### Revised Literacy Test

In view of the above-mentioned limitations, it was decided to develop a modified literacy skill test. The new test took into account the modifications and revisions in the literacy curriculum. Further, the test was so structured as to discriminate between people at the lower end of achievement in a more detailed manner.

It should be pointed out that two different tests were administered to the respondents. The analysis plan envisages comparison of an individual's scores at two points in time. In order to facilitate this, it was decided to express the scores as percentages rather than as raw scores.

*Validation of Revised Test:* The revised test was administered to the students in five rural schools near Mahbubnagar. The results are presented in Table II. In view of the low level of achievement in literacy in Phase I of the study, it was decided to administer the test to grade 1 students also. The original test had not been administered to grade 1 students. The tests was not administered to grades 4 and 5. The data were used to interpret the achievement of the respondents in the area of literacy skill.

TABLE II: Means and standard deviations of achievement in literacy skill of selected rural children in Mahbubnagar district (Revised test)

Grade in school	N	Reading achievement	Writing achievement	Arithmetic achievement	Total 3-R achievement
One	40	54.13 (24.84)	25.30 (29.72)	18.95 (22.33)	36.43 (22.40)
Two	40	79.90 (21.53)	62.55 (24.88)	48.88 (24.31)	64.22 (19.88)
Three	38	92.29 (12.53)	79.58 (8.34)	77.53 (20.31)	82.72 (12.64)

### PHASE II SURVEYS

It may be recalled that Phase II was an extension and revision of Phase I. Therefore the questionnaires used in the surveys carried out in Phase II were similar to the questionnaires used in Phase I, the one exception being the test of Cognitive Development which could not be carried out in Phase II.



The data collected in Phase I were analysed item-wise and examined for their adequacy and modifications were carried out. The extension and modifications that were undertaken can be grouped under three headings. First, the Phase I main schedule, by and large, made use of an open-ended question format wherein the responses were recorded verbatim. Based on the responses recorded in the Phase I survey, response categories were developed and the schedule was made into a precoded schedule. Second, for a few questions where the code categories were not adequate (for example, cause of death of children) more appropriate codes were developed. Third, the schedule to elicit clinical signs of nutritional deficiency was found to be very inadequate and an entirely new set of schedules was developed.

### **Post-Survey Schedule**

The purpose of the post-survey schedule was to measure the changes that have taken place in knowledge, attitude and practice in the areas of nutrition, health and family planning. So the schedule that was used for the Bench Mark Survey was made use of for the post-survey also. As the demographic characteristics (like age and sex) and retrospective pregnancy history could not have changed, they were omitted from the post-survey schedule. But information on mortality, morbidity and pregnancies that occurred since the Bench Mark Survey was collected.

In addition, a set of supplementary questions pertaining to the three action programmes was also prepared. These questions sought to collect information on the attitude towards the classes, messages learned, the manner in which the nutritional supplements given were used, etc. Since these questions were relevant for the women in the action programme only, they were not pretested. The investigators who had gained fairly wide experience by this time in carrying out surveys were fully consulted. It should be said to the credit of the investigators that except for one or two questions, all the questions were successfully canvassed in the actual situation.

As the sample of women who were eligible for the post-survey of Phase I was expected to be less than 185, the schedules were mimeographed and not printed. Although all the investigators were familiar with the schedule, they were trained once again for this survey.

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## CHAPTER XV

# SAMPLE DESIGN

**Sunanda Mitra**

Selection of Project Area — First Stage of Sampling: Village Selection; Eight Villages in Two Contiguous Blocks; Language and Religion; Target Population; Distance from Health Centres; Geographical Isolation and Programme Logistics — Special Importance of the Control Group — Homogeneous Socio-Economic Characteristics — Second Stage of Sampling: Selection of Participants — Phase II: Sampling Procedures: Selection of Villages — Homogeneity within the Quadrants — Selection of Participants — Sampling, Attrition and Bias — Violation of Principles of Sampling; Village Selection; Random Assignment of Villages to Treatments; Selection of Individuals — The Substitution List — Under-enumeration — Sample Attrition: Population to Sample List; From Sample to Bench Mark Survey; From Bench Mark Survey to Resurvey — Magnitude of Bias due to Sample Attrition.

### *Abstract*

In the first phase of the study, 240 participants from 8 villages were to be selected and in the second phase 660 were to be selected from 22 villages. This chapter describes the procedures adopted for the selection of participants for Phase I and Phase II; it also deals with sample attrition.

THE FIRST PHASE of the experiment was to be conducted in two blocks closest to the district headquarters (Mahbubnagar) and Jedcherla. A two-stage sampling procedure was adopted for selecting the villages (operationally hamlets)<sup>1</sup> and the participants, maximise homogeneity among the four experimental treatments and then to permit randomness within the constraints imposed by the experiment. In each of the two blocks, the villages formed the units of sampling at the first stage, and eligible women at the second stage.

### **Selection of Project Area**

Since this experiment related to rural women, we needed to get outside the metropolitan influence of Hyderabad. At the same time, it was

necessary to retain the institutional basis in the city to carry out the experiment adequately. The selection of Mahbubnagar district and the two blocks adjacent to district headquarters was based on logistic and institutional convenience. The Council for Social Development has an office in Hyderabad and the Andhra Mahila Sabha has its offices in Hyderabad and Mahbubnagar. While the former is the research agency conducting the experiment, the latter is a sister voluntary service organisation (with common founding presidents and executive directors or board members) which has training facilities for Auxiliary Nurse Midwives and also a Literary House for adult education, both necessary for the experiment.

Mahbubnagar is the district administrative headquarters with a population of 51,756, according to the 1971 Census. A traditional town with little or no industrial life, it provides a number of social and political institutional facilities for its hinterland, but it lacks the magnetic economic or industrial pull of a metropolis. The choice of Mahbubnagar district was guided by the fact that the area was sufficiently rural and representative of Indian village conditions. Incidentally, Mahbubnagar district also happened to be one of the Drought-Prone Districts (DPD) in the country. (There are now about 60 such DPD in India which particularly during the last few years have suffered severe drought conditions and consequent nutritional and social imbalances. The advantages and disadvantages of running an experiment under such unique conditions have been discussed elsewhere.)

It was felt that for Phase I of the experiment, logistic convenience plus lack of governmental health facilities should be the ground rules for selecting the sample villages. Therefore, the two blocks contiguous to the district headquarters – the Mahbubnagar and Jedcherla blocks offered themselves as the ideal region from which the eight villages for Phase I of the experiment could be selected. Among the eight villages, six were to receive the experimental action programme (two villages under each of the three experimental conditions) and two villages were to serve as 'control villages' in which there will be no experimental programme.

### **First Stage of Sampling: Village Selection**

Since it is not feasible in the survey research to study the *entire* population, a sample or portion of a finite population is studied as



representing a wider universe. In this case the population would be the three selected vulnerable groups of women living in the two blocks of Mahbubnagar district, the implicit universe is the vulnerable groups of rural women of India.

The objective is to extrapolate the findings for the wider universe. However, as the population to be studied is rarely homogeneous, stratification is used as a technique to control heterogeneity. The entire population is divided into relatively homogeneous strata and then the samples are drawn from each stratum.

For the present study, the setting is narrow and the focus is on a small number of variables; hence a field experimental design is found to be more appropriate. As such field experiments have been rare, no detailed manual of techniques to draw the sample was available. Our main aim was to isolate more or less homogeneous target populations and randomly select within the strata a sample which is as representative of the population in a systematic manner as the experimental conditions permit.

*Eight Villages in Two Contiguous Blocks:* The population or sampling frame for the first phase of the study was constructed from villages in the above-mentioned two contiguous blocks. Since the main purpose of the pilot phase was to get 'trial and error information' on the effects of the experimental treatments, the number of villages had to be kept as small as possible. At the same time, it was necessary to have a sufficient number of cases which could yield meaningful information. In the light of these considerations, the number of villages was kept to the small number of eight. (The number of villages selected for study should be a multiple of four as there were four experimental conditions.)

The sample was designed in such a way as to control the effects of other extraneous and contaminating effects of variables that may interfere in the relationship between independent and dependent variables. To maximise homogeneity, control extraneous variables and to minimise logistic problems for the experimental treatments, the following procedures were adopted.

*Language and Religion:* Though most of the villages in the study area are Telugu-speaking, the Muslim and tribal populations have Urdu or Hindi linguistic affinities to a greater or lesser extent. In order to control this sub-cultural variation due to language and to a lesser extent religion, the villages which contained a significant proportion of Muslim or tribal households were eliminated from our study. Five

villages were excluded from the total number of 190 villages in the above-mentioned two blocks, as they contained a significant percentage of either Muslim or tribal households. (Operationally, if more than 20 per cent of the village households were classified as Muslim or tribal in a village, it was dropped from the sampling frame.)

*Target Populations:* The Crude Birth Rate (CBR) of India is approximately 40 per thousand of population. Since the village birth rate was considered to be important for programme effects, a preliminary household survey was carried out during November 1972 to determine the population of 'eligible' women who would be available for the experimental programme in villages included in the sample. A purposive sample of seven villages was chosen for this exploratory survey in order to have a better estimate of the number of households required to obtain the quota of 30 women - 10 women in each of the three target groups. On the basis of 40 as CBR per thousand of population, it was estimated that with 140 to 150 households there should be at least 15 women in each target category. But to facilitate some randomness and allow for some attrition, there should be more than the minimum quota of women in each category.

The preliminary household study showed that 140-150 households were not enough even to obtain 10 women in each of the three groups, especially in respect of pregnant women. We found that the restricting criterion was pregnancy which was typically not reported before the third or fourth month. We, therefore, decided to use a few probe questions to try and detect pregnancy earlier. As a result of the findings of this preliminary survey, it was decided that approximately 175 households would have to be the minimum in each village in order to yield the desired number of women eligible villagers. This reduced the total number of eligible villages from 185 to 94 in the two blocks.

*Distance from Health Centres:* In the two blocks under study there are two hospitals and four Primary Health Centres. It was assumed that the villages close to such facilities due to their propinquity with the health institutions provided by the State Government would have benefited more from the health services and this factor would either have to be tested and experimentally controlled or be excluded from the study.

Actual distances travelled and services utilised by villagers to reach medical centre were not determined owing to lack of time to collect and analyse this kind of village movement to and from the centres. Had this been possible, we might have obtained an objective basis for



fixing service areas so that villages within certain limits would be eliminated and villages beyond the limit would be included in the study. Based on distance decay functions of actual utilisation of health facilities, computed in other parts of India for the Growth Centre Project,<sup>2</sup> we decided to exclude from our study villages that were situated within a radius of 5 km from a hospital and 3 km from a Primary Health Centre.<sup>3</sup> An additional reason for the distance exclusion which was discussed with the Block health staff was overlap of services; they felt that if we worked in areas with lower levels of service, it would be a more equitable distribution of health services.

Thus, these exclusion criteria reduced the total number of villages in the area from 190 to 185 villages on the first criterion of language and religion; the effect of applying the criterion of 175 households further reduced the number of villages to 94. Again the effect of applying the health-institution-distance criterion reduced the villages from 94 to 75. Table I (see Appendix 11) gives the number of villages excluded by each criterion and the number of the remaining villages in the sampling frame.

*Geographical Isolation and Programme Logistics:* In locating experimental treatments, we have to ensure the isolation of each experimental treatment. If two naturally existing groups, in this case villages, that are near to each other, happen to be on different experimental treatments, participants in one treatment may be aware of the experimental treatment in the other group. In such cases, they may be influenced by a treatment which is not intended for them. This is called 'spillover effect'. There is also an additional factor of 'inner-experimental unit competition' which can be defined as 'advantageous or deleterious influence of one experiment unit upon another'.<sup>4</sup>

In this experiment we had to control both these types of effects; the latter is, however, more important in view of the free medical examinations, medicines and the feeding programmes in two of the three experimental treatments. Hence villages receiving different treatments should be isolated from each other as far as practicable.

Ideally, to minimise this type of interaction effect, the lines of division should be made along the ridges of natural watersheds, between what we are called the 'trees' of human traffic flow. Since these flows were not known, we used Mahbubnagar town as a central axis. Two straight lines were drawn on the map in such a manner as to divide the area of Mahbubnagar and Jedcherla blocks into four equal quadrants in order to provide for the four experimental conditions.



Each of the four quadrants were randomly assigned the four experimental conditions. Quadrant I in the north of Mahbubnagar was Control; Quadrant II to the west was assigned Functional Literacy; Quadrant III to the south was assigned MCC plus Functional Literacy plus Non-formal education; and Quadrant IV to the east was assigned Non-formal Education.

A special advantage of the quadrant *Separation* of the experiment lay in bringing together villages in each experimental treatment for the most convenient management of each programme. Since the minimum supervisory unit was two villages, we needed eight villages so that each treatment would cover at least two villages. Further, the travel distance between the two villages should not be more than 3-5 km; otherwise, the women Maternity Assistants or Literacy Supervisors who have to walk twice a week from one village to the other will not be able to cope with long distances in rural areas. The MCC Supervisor (a medical officer) was expected to visit each of the villages in a jeep once a week in the Phase I villages and once or twice a month in the Phase II villages. While the experiments needed proximity to each other for greater programme efficiency, the villages had to be kept isolated for the different experimental treatments.

### Special Importance of the Control Group

In this field experiment, the control group, one of the four experimental groups, assumes special importance. The control group is a group of respondents whose performance on a dependent variable is used as a basis for evaluating the relative performance of the experimental groups on the same dependent variable. In the absence of such a control group, meaningful comparisons will not be possible and hence inferences may be spurious.

If a governmental agency or a private organisation plans and conducts an elaborate campaign in a 'control group' which might disturb the experimental treatment, it may lose its status as 'control'. So an additional control village was selected, subject to all the criteria elucidated above and the Bench Mark Survey was carried out along with other villages. If one of the villages in the control category is 'lost' to the experimental study, then the additional village which is already pretested was to be substituted. Because of the importance of the control village to the field experiment, additional time and money spent on one more village was considered well worth the effort.



However, as it happened we did not have to make use of the spare control village.

### **Homogeneous Socio-Economic Characteristics**

All the villages in each of the four quadrant frames were so selected as to be homogeneous in respect of such socio-economic characteristics as the total number of households, percentage of cultivators, percentage of female literates, average amount of land possessed, total number of facilities and the number of Government personnel living in the village.

In order to select villages with the greatest homogeneity located in each quadrant from the frame of 75 villages, the following operations were undertaken:

1. a village survey was conducted during September 1972, covering 103 village-hamlets (since all exclusion criteria had not been agreed upon at that time);
2. several village characteristics were studied in the survey and those variables were stored in seven IBM cards;
3. a summarised form of the selected variables was scored on the eighth IBM card: and
4. by using a card sorter, the distribution of scores for such selected variables was determined.

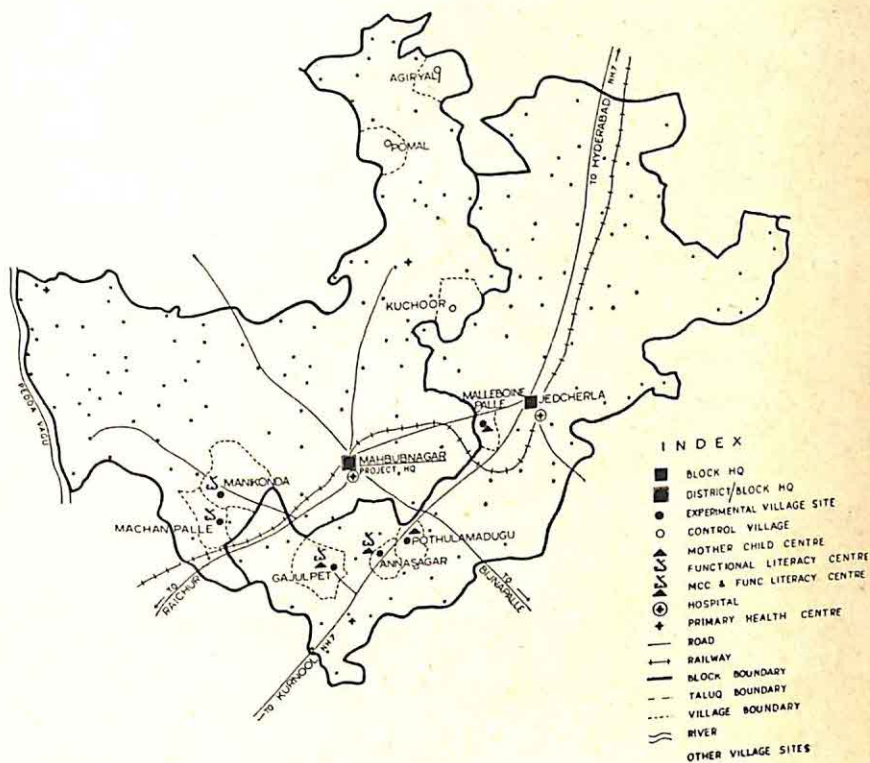
Villages having extreme scores (upper or lower) on these eight variables were progressively excluded from the list of the sampling frame. This final selection further reduced the number of villages from 75 to 45. These were regarded as villages with a relatively homogeneous population and they served as the sampling from which two villages in each quadrant could be selected at random.

Quadrant I had 12 eligible villages, Quadrant II had 14, Quadrant III had 7 and Quadrant IV had 12. One experiment was randomly assigned to each quadrant. From each quadrant, four villages were selected randomly from which the programme staff could finally select any two villages in which they could conduct the experiment.

Project officials visited all the 16 villages to determine whether political conflicts, unwillingness to cooperate, village conflicts, condition of roads or other problems were present as these would be harmful to the operation of the experimental programme. On the basis of their assessment, two villages from each of the four quadrants were

# NON FORMAL EDUCATION PROJECT

PHASE I SAMPLE VILLAGES IN MAHBUBNAGAR & JEDCHERLA BLOCKS,  
MAHBUBNAGAR DISTRICT, ANDHRA PRADESH.





selected finally for different treatments, as detailed in Table II (see Appendix 11).

### **Second Stage of Sampling: Selection of Participants**

Thirty women – 10 from each of the three target groups – were being studied in each of the nine finally selected villages. The number of women per village was limited to 30 on the basis of the experience of Literacy Classes and Mahila Mandals which cater to a similar number of participants. The target groups were: (a) pregnant women, (b) nursing mothers, and (c) mothers with children from 7 to 36 months of age since these groups are considered nutritionally vulnerable to illness, disease and death. The age-range of the participants was 15-45 years. In order to ensure comparability between experimental and control groups, all women selected were functionally illiterate, with zero to three years of primary education.

A household census in each of these nine villages was conducted for constructing sampling frames from which the three categories of women could be selected. The basic eligibility criteria were:

1. to be a currently married woman between 15 and 45 years of age;
2. to have 3 years or less of schooling and be reportedly illiterate;
3. to belong to one of these vulnerable categories: (a) pregnant between 2 and 7 months; (b) nursing a child 0-6 months of age; and (c) have at least one child aged 7-36 months.

From the lists prepared on the basis of the above criteria, 10 women were selected at random from each category, totalling 30 per village. In this second household survey, it was found that the number of pregnant women were less than 10 in three of the study villages. The number of eligible women, village-wise, is listed in Table III (see Appendix 11).

Wherever necessary, the Project Medical Officer was given the responsibility of identifying additional participants. In cases where the number of pregnant women after this second effort was less than ten in a village, nursing women were taken in to fulfil the quota. To some extent these two experimental categories will merge during the experimental period as all pregnant women will predictably deliver their child within 2 to 7 months and then become nursing mothers. It is also quite possible that women in the nursing or weaning categories



will become pregnant during the experimental period.

## PHASE II

### Sampling Procedures

In Phase II of the study, 660 participants from 22 villages were to be selected to participate in the experiments. A two-stage sampling procedure was adopted: first, for selecting the villages and second, for selecting eligible mothers or mothers-to-be in the selected villages. The principles and procedures adopted for Phase II sampling were similar to those followed in Phase I, and so we will briefly explain the procedures adopted in the selection of participants from the 22 villages.

Phase II was to be conducted in four blocks nearest to the district headquarters. In addition to Mahbubnagar and Jedcherla blocks which were already taken for the first phase of the sampling, a portion of Atmakur and Wanaparthy blocks were selected, covering an area of 30-35 km, bordering on Mahbubnagar town. Of these 22 villages, 16 received the experimental action programme (6 villages each under MCC and MCC+FLIT; 4 under FLIT) and six served as control villages which were used as a basis for comparing treatment effects in the experimental villages.

*Selection of Villages:* It was not expected that these 22 villages could form a randomly adequate sample of the village population, but they can be considered as being reasonably representative of the population, culturally and geographically. As in the case of the first phase, the second phase village population was also restricted to Telugu-speaking, non-tribal and non-Muslim villages. The sample was also designed in such a way as to control the effects of extraneous and contaminating variables that might interfere in the relationship between independent and dependent variables. Four such variables were: (a) language and religion, (b) village size to ensure an adequate number in target groups, (c) distance from Government health services, and (d) village proximity. Each became an important consideration in restricting the population definition or in forming homogeneous strata.

On the basis of the above criteria we excluded from the study: (1) those villages which contained a significant percentage of either Muslim or tribal households; (2) those villages that were situated



within a radius of less than 5 km from a hospital, 3 km from a Primary Health Centre and 1 km from a subcentre; (3) the villages which had less than 175 households and more than 350 households; (4) the villages which had internal factions; and (5) the villages without all-weather roads. To avoid 'spillover' effects, the pattern followed was to divide the area around Mahbubnagar (excluding Phase I area) into two clusters. One cluster consisted of upper part of Atmakur and a part of Mahbubnagar block. The other cluster consisted of upper part of Wanaparathi and Jedcherla blocks. Taking an imaginary central point in each of the two clusters, two lines were drawn, so as to form four physical areas – 'quadrants' – in each cluster. The quadrants closest to Phase I villages were assigned the same treatment as that of Phase I to avoid contamination effect. The other quadrants in each cluster were randomly assigned one experimental treatment.

### **Homogeneity Within the Quadrants**

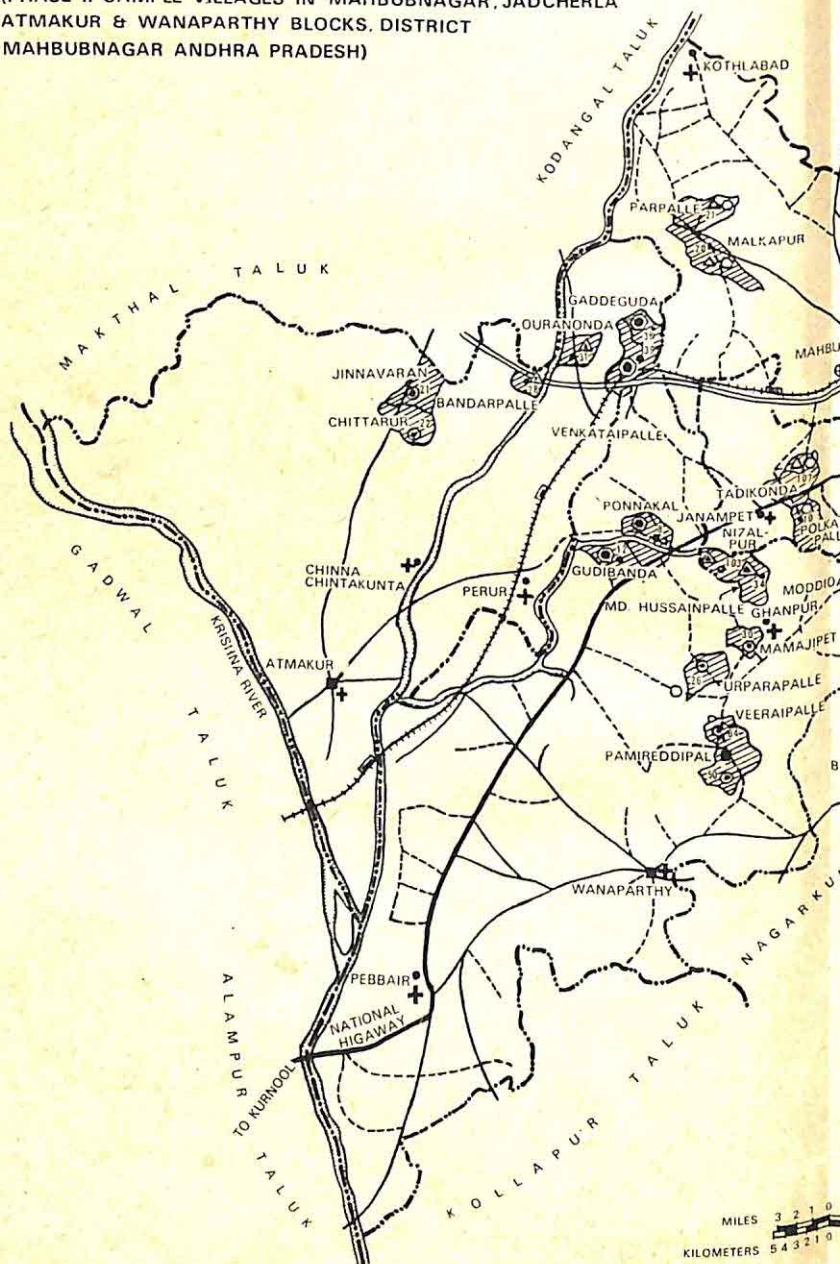
Within each quadrant, the eligible villages were made homogeneous in terms of such socio-economic characteristics as percentage of female cultivators, percentage of female literates, types of castes, average landholding, etc. To improve homogeneity within quadrants, the following procedure was used: (1) for each cluster several variables were studied by examining the 1971 Census figures such as number of households, percentage of scheduled castes, percentage of women literates, percentage of women agricultural labourers, and percentage of women cultivators; (2) the distribution of scores for each variable was determined; and (3) any village having extreme scores (above or below the percentile of the village distribution) was eliminated from the sample frame. Finally from each quadrant of two clusters, four villages were selected ( $N = 32$ ). The project officials visited all the 32 villages to determine whether political conflicts, unwillingness to co-operate, village conflicts or other disruptive problems harmful to the operation of the experimental programmes were present. On the basis of their findings, from the Atmakur-Mahbubnagar block cluster, two villages were selected from each quadrant for CONT, MCC, FLIT and MCC+FLIT experimental treatments. In a similar manner, from the second cluster, i.e., the Wanaparathi-Jedcherla block cluster, four villages were selected for CONT, MCC and MCC+FLIT experimental treatments and two for FLIT treatment. The villages from both the clusters are listed in Table IV (see Appendix 11).

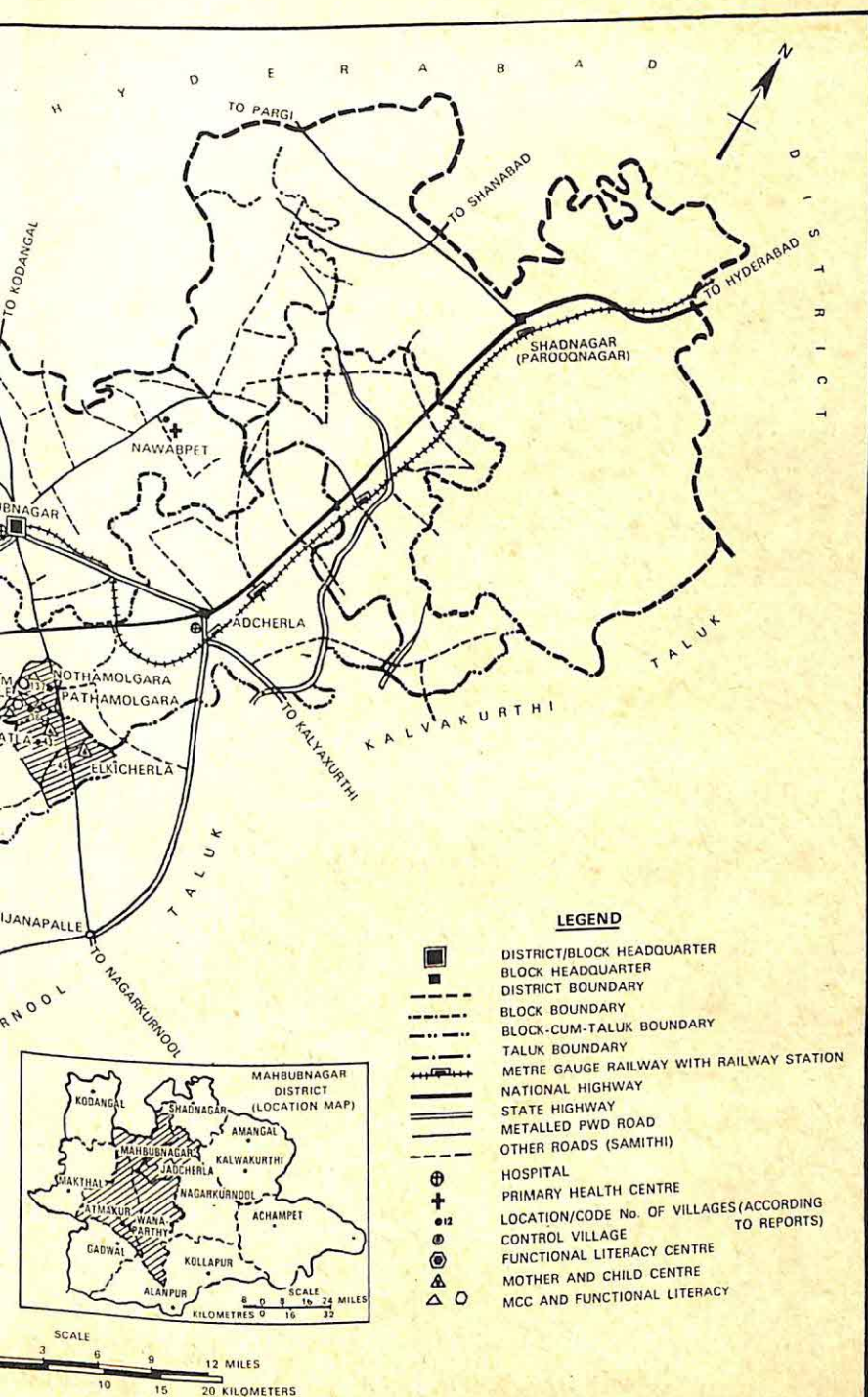




# NON-FORMAL EDUCATION PROJECT

(PHASE II SAMPLE VILLAGES IN MAHBUBNAGAR, JADCHERLA  
ATMAKUR & WANAPARTHY BLOCKS, DISTRICT  
MAHBUBNAGAR ANDHRA PRADESH)









### **Selection of Participants**

Thirty women from each of the three target groups were to be randomly selected. A household survey was conducted in each of the 22 selected villages in order to construct sampling frames from which the three categories of women could be selected. From these lists, 10 women from each category were randomly selected.

Many village women in their first trimester of pregnancy just do not know or will not admit that they are pregnant; thus there appeared to be much under-reporting of pregnancies. It was particularly the problem of enumerating pregnant women that led to the upward revision of village household population to 175 from the estimated number of 120-125.

A team of motivators (2-4 in number), who were later to work as Literacy Teachers and Health Educators in the project, visited the villages and contacted the women, explained the nature of that particular treatment, answered their questions and obtained their consent to participate in the programme. If they refused, (even after persuasion) a name from the substitute list was included. Usually the motivators made two or three visits to a village. The research team contacted those respondents who agreed to join the programme and conducted the Bench Mark Survey.

### **Sampling, Attrition and Bias**

It may be recalled that the principle of randomness was introduced at three levels, namely, at village selection, assignment of the experimental treatment to the selected villages, and selection of participants. But the principle was violated in varying degrees. In addition, the sample attrition was very high in this project. In any longitudinal study, sample attrition could be expected. But in this study the Resurvey could be conducted only in respect of those who participated in the experimental manipulation. Further, the sample attrition was not uniform for all the experimental treatments. Because of this, the extent of bias that could be present in generalising the findings needs to be examined.

Unfortunately when the study was designed, a high degree of sample attrition was not envisaged. So no systematic data were collected to document and explain sample attrition. An opportunity to assess this was thus lost. Later, efforts were made to collect some



relevant data as the study progressed. Hence, some of the data presented in this chapter are incomplete.

It is strongly recommended that any longitudinal study involving participation in a programme should be so designed that it would facilitate collection of systematic data on the basis of which sample attrition could be examined in detail and the magnitude of bias determined.

### **Violation of Principles of Sampling**

*Village Selection:* Sometimes if villages in the sample list were not suitable, some other villages (bearing in mind the need for homogeneous characteristics) were taken in. Table V (see Appendix 11) gives details regarding the substitution for Phase II villages.

The major reasons for substitution of villages were as follows:

(i) One of the major criteria was that the two villages in a treatment should be close to each other (operationally 3-5 km or less), so that the Supervisor could walk from one to the other village. Even when a village in the list was otherwise suitable for the programme, it had to be dropped, if the second village was not available at a walking distance. Conversely, sometimes a suitable village not in list was selected if it happened to be the only such village within walking distance of the first selected village.

(ii) It was found that some villages in the sample list had adequate roads during summer but not during the rainy season. Since the project was to last for one full year, all such villages in the list which did not have adequate road connections during monsoon season were not selected.

(iii) In some villages, there was the problem of local leadership. As most of the Teachers/Educators were young girls, strong leadership at the village level was very essential to guarantee their safety. If a village did not have strong local leadership, it was not selected, even though it was in the list.

*Random Assignment of Villages to Treatments:* As already stated, the quadrants were assigned randomly to experimental treatments in Phase I and this worked well as they were completely in the control of the project officials. But in the case of villages that were selected for CONT and FLIT, the village leaders were trying to pressurise the



project officials to assign some other treatment. When it was made clear that this was not possible, the cooperation and help extended by those leaders became much less.

The Phase II study area overlapped Phase I area. So the quadrants closest to Phase I villages were assigned the same treatments as that of Phase I. Although this was done to avoid contamination effect, the fact remains that the principle of randomness was violated. Trying to avoid one pitfall led to another.

*Selection of Individuals:* Individual women were to be randomly selected. Table VI (see Appendix 11) gives the mean number of women by target groups for both Phase I and Phase II. It will be seen that the mean number of pregnant women in two of the treatments of Phase I was less than 10. So, no random selection was possible. Given the number of 0-6 months old children in a village (given as nursing mothers in the table), one would expect a larger number of pregnant women in these villages. It is possible that the women in the early stage of pregnancy were not aware that they were pregnant. The table also shows that in respect of Phase II villages, the number of pregnant women identified were more than in Phase I. Yet, the numbers were not sufficient to warrant random selection of respondents for this target group.

In the Phase I study when an adequate number of women from the sample list was not available to participate in the programme, a few who were not in the sample list were included; Table VII gives the details (see Appendix 11). There were two reasons for this. First, in the Currently Pregnant target group, an adequate number of women was not identified to enable us to select the participants randomly. Table VII (Panel A, item 1) shows that both in CONT and MCC treatment villages the total number of currently pregnant identified women were less than 20 (or about 10 each from two villages). So no random selection of participants was possible for the currently pregnant target group. Second, among those who were in the sample list a few refused to participate in the experimental manipulation. Among the 224 who were in the sample list, only 90 (or 40.1 per cent) agreed to participate. The Bench Mark Survey was carried out in respect of those who agreed to participate. Among them a few did not participate in the programme when it started or dropped out later when it was in progress. Table VII shows that out of 224 in the sample list, only 66 (or 23.5 per cent) participated in the programme, and were eligible for Resurvey.



### The Substitution List

When items 2 and 4 in Panel D of Table VII are compared, it will be seen that among those who were in the sample list 50 per cent were eligible for Resurvey in CONT, 6.7 per cent in FLIT, 42.6 per cent in MCC, and 20.4 per cent in MCC+FLIT. This shows that in the two experimental treatments with functional literacy, namely FLIT and MCC+FLIT, the sample attrition was very high.

When the programme was started, an effort was made to enroll more women from the Substitution List. In some cases, a few women who were *not* in the Substitution List were also included in the programme. Item 5 in each of the panels gives information about such people in each of the target group. For these *ad hoc* enrolments, no systematic efforts were made to select the 'best' participants and the nature and magnitude of bias introduced by such *ad hoc* enrolments is not known.

### Under-enumeration

The inability to identify a portion of the study population could be due to many factors. Two such factors will be explored here. Given the number of 0-6 months old children in a village, after adjusting for infant mortality and maternal mortality, the expected number of pregnant women was computed. Based on the observed number of currently pregnant women, percentage of under-enumeration was calculated. It worked out to be 24.30 per cent for all the villages. When the household data were collected from one of the couples, the percentage of under-enumeration was 25.38. But for those households where the data were collected from other members of the household, the percentage of under-enumeration was 32.24. This shows that if the household data are to include conditions like pregnancy, the data should be collected from the couples only.

It is also possible that the manner in which the information was elicited by different investigators could have resulted in under-estimation. Table VIII (see Appendix 11) gives the percentage of under-enumeration of currently pregnant women for each of the investigators. This variability in individual ability to enumerate should be reduced by better training of the interviewers.

### Sample Attrition

It may be recalled that for Phase II, the planned sample size was 660. But as Table IX (see Appendix 11) shows, only 529 or 80.2 per cent agreed to participate in the experimental manipulation and were interviewed for the Bench Mark Survey. And only 324 or 49.1 per cent of the planned sample or 61.2 per cent of those who participated in the Bench Mark Survey were interviewed for Resurvey. So an examination of the various stages at which the sample attrition took place and the magnitude of bias introduced by sample attrition is called for.

Table IX shows that (except for CONT) the planned sample size was not interviewed for the Bench Mark Survey in any of the three treatments. The sample attrition was the highest in FLIT. When the women were told that literacy classes will be conducted for them, many simply refused to join the programme. Even the MCC and MCC+FLIT treatments where supplementary foods and medical care were provided, about 20 per cent of the planned sample size could not be fulfilled. This was partly due to fear of forcible sterilisation that may be carried out in the Centre, as there had been a mass sterilisation drive in the district only a month before the start of the Bench Mark Survey. So the fear of forcible sterilisation was very fresh in their memory. To disassociate the project from the family planning scheme, the UNICEF had supplied a jeep, white in colour, and it was painted green. Apparently, even this did not help!

Item 3 in Table IX shows that about 79 per cent of those who took the Bench Mark Survey (or 43 per cent of the planned sample) in FLIT treatment did not participate in the programme or attended less than 25 per cent of the classes. This shows that even among those who agreed to participate in the programme when they were initially contacted, some had changed their mind when the programme actually started or had lost interest during the course of the year.

Item 5 shows the proportion of the planned sample and those interviewed in the Bench Mark Survey who were interviewed in the Resurvey. It ranges from 10 per cent for FLIT to 63 per cent for CONT.

Table IX gives a bird's-eye view of the stages at which sample attrition had taken place. These stages were: (a) population to sample list; (b) sample list to Bench Mark Survey; (c) Bench Mark Survey to actual participation; and (d) actual participation to Resurvey. Each of



these stages will now be discussed in some detail.

(a) *Population to Sample List*: It is well known that one of the major sources of non-sampling errors is the inability to identify a portion of the study population. In this study the currently pregnant women formed part of the study population. It was well-nigh impossible to identify all these women. But given the crude birth rate and number of 0-6 months old children in a village, it was possible to make an estimate of the number of pregnant women who could be found in the village. This has been discussed in detail earlier in this chapter and the error varied from 25 to 35 per cent; the error of omission is probably not random.

(b) *From Sample to Bench Mark Survey*: Once the sample list was drawn up, the listed women were individually contacted by those who were to work as Functional Literacy Teachers/Health Educators (called 'motivators' in the project's parlance). The motivators took the help of the local village leaders. This was necessary because the project people, regarded as outsiders, did not command much credibility among the villagers. The women were told about the programme and their consent to participate in the programme was sought. The Bench Mark Survey was attempted only on those who agreed to participate.

It was observed that in some of the villages there was a considerable number of dropouts even though selected participants agreed to participate in the Bench Mark Survey when contacted by motivators. So we felt the necessity to find out the reasons for such non-participation. Table X (see Appendix 11) gives some of the reasons adduced for non-participation.

(c) *From Bench Mark Survey to Resurvey*: Not all of the women who agreed to participate and took the Bench Mark Survey attended classes for the entire duration. Table XI (see Appendix 11) gives details regarding attendance in the education classes.

It was arbitrarily decided to define 'participants' as those who attended 25 per cent or more of the classes as they are the ones who could have benefited from the classes. Such people alone were eligible for Resurvey. Some sample attrition occurred because of this criterion. If a lower cut-off point was adopted, the magnitude of sample attrition would have been less. In addition a few who were eligible for Resurvey were not available or refused to be interviewed. Table XII (see Appendix 11) gives reasons for non-availability of respondents at the time of Resurvey.

It should be pointed out that about three call-backs were attempted and the investigators visited the village between 6 and 8 a.m. Yet about 3 per cent had already gone for work; about 17 per cent had gone to other villages for a visit and about 3 per cent were sick. If the call-backs were spread over many days rather than on subsequent days (as it was done here), this proportion could have been reduced among those who were surveyed. About 21 per cent in CONT group refused to be interviewed.

### Magnitude of Bias due to Sample Attrition

Having documented the sample attrition, the next question that logically arises is: to what extent are the findings based on the women in the Resurvey representative of the women in the Bench Mark Survey? Although a conclusive answer could not be given, some data will be presented which may throw some light on the extent of bias.

Table XIII (see Appendix 11) gives univariate distributions for women in the Bench Mark Survey and Resurvey. It will be seen from this that except for the FLIT treatment, the percentage distributions (or means) for all the variables were almost identical for Bench Mark Survey and Resurvey. It can be stated that the findings based on the women who were in the Resurvey are representative of those in the Bench Mark Survey. So, perhaps, very little bias is introduced between Bench Mark and Resurvey for three of the experimental treatments.

### Notes and References

1. Since the Census 'village' contains more than one hamlet as much as 2-3 miles apart, for social, logistic and programme operation purposes these may be treated as separate villages. Census data for hamlets are not available. Hence a 'hamlet' (village) survey had to be conducted in all eligible hamlets.
2. 'Pilot Research Project in Growth Centres' was conducted by the Ministry of Community Development.
3. According to a study conducted by the Ministry of Community Development entitled 'Pilot Research Project in Growth Centres', about 50 per cent of the patients both for Primary Health Centres and Hospitals came from distances of about five kilometres or less.
4. Walter J. Federer, *Experimental Design: Theory and Application*. Delhi: Oxford and IBH Publishing Co., 1967, p. 60.



## APPENDIX 11

TABLE I: Villages eligible to be included in the sample frame for Phase I

	Mahbubnagar block	Jedcherla block	Total
1. Total No. of villages	101	89	190
2. a. Villages with a majority of Muslim or tribal households	3	2	5
b. Villages within 5 km of H.O. hospital	4	3	7
c. Villages within 3 km of P.H.C.	8	4	12
d. Villages with less than 175 households	43	48	91
(a + b + c + d)	58	57	115
(1 - 2)	43	32	75

TABLE II: Names of villages\* selected for Phase I study

Types of experimental treatment	Name of village	Block	Taluk
CONT	Pomal	Mahbubnagar	Shadnagar
	Kuchoor	Mahbubnagar	Mahbubnagar
	Agiryal (Reserved)	Mahbubnagar	Shadnagar
FLIT	Manikonda	Mahbubnagar	Mahbubnagar
	Machanpalle	Mahbubnagar	Mahbubnagar
MCC	Malleboinpalle	Jedcherla	Mahbubnagar
	Pothulamadugu	Jedcherla	Mahbubnagar
MCC+FLIT	Annasagar	Jedcherla	Mahbubnagar
	Gajulpet	Jedcherla	Mahbubnagar

\*The map on page 161 gives the location of each of these villages.

*Sample Design*

TABLE III: Distribution of target women in the selected villages - Phase I

Type of experimental treatment	Name of village	Target women		
		Pregnant	Nursing	Weaning
CONT	Agriyal	9	22	54
	Pomal	6	21	82
	Kuchoor	11	32	72
FLIT	Manikonda	17	65	111
	Machanpalle	11	24	79
	Malleboinpalle	6	12	41
MCC	Pothulamadugu	11	25	49
	Annasagar	15	40	52
MCC+FLIT	Gajulpet	12	40	75
Total		98	281	615



TABLE IV: Villages selected for Phase II

Type of experimental treatment	Name of village	Location code (as in 1971 Census Reports)	Block	Taluk
<i>A. Cluster I</i>				
CONT	Manajipet	30	Wanaparathi	Wanaparathi
CONT	Pamireddipalle	50	Wanaparathi	Wanaparathi
CONT	Upparapalle	26	Wanaparathi	Wanaparathi
CONT	Veeraipalle	51	Wanaparathi	Wanaparathi
FLIT	Gudibanda	12	Wanaparathi	Wanaparathi
FLIT	Ponnakal	8	Wanaparathi	Wanaparathi
MCC	Maddigatla	43	Wanaparathi	Wanaparathi
MCC	Elkicherla	44	Wanaparathi	Wanaparathi
MCC	Md. Hussainpalle	34	Wanaparathi	Wanaparathi
MCC	Nizalpur	103	Jedcherla	Mahbubnagar
MCC+FLIT	Kotha Molgara	137	Jedcherla	Mahbubnagar
MCC+FLIT	Patha Molgara	136	Jedcherla	Mahbubnagar
MCC+FLIT	Polkampalle	106	Jedcherla	Mahbubnagar
MCC+FLIT	Tadikonda	107	Jedcherla	Mahbubnagar
<i>B. Cluster II</i>				
CONT	Chittanur	22	Atmakur	Atmakur
CONT	Jinnavaram	21	Atmakur	Atmakur
FLIT	Gaddeguda	38	Atmakur	Atmakur
FLIT	Venkataipalle	39	Atmakur	Atmakur
MCC	Bandarpalle	29	Atmakur	Atmakur
MCC	Gurakonda	31	Atmakur	Atmakur
MCC+FLIT	Parpalle	21	Mahbubnagar	Mahbubnagar
MCC+FLIT	K. Malkapur	20	Mahbubnagar	Mahbubnagar

TABLE V: Number of villages finally selected from the sample list and outside the sample list (Phase II)

Type of experimental treatment	No. of villages in the sample list	No. of selected villages from the sample list	No. of selected villages outside the sample list
CONT	12	6	0
FLIT	11	4	0
MCC	12	3	3
MCC+FLIT	11	5	1
Total	46	18	4

TABLE VI: Mean number of target women in the selected villages by experimental treatments (Phases I and II)

Type of experimental treatment	Mean number of target women		
	Pregnant	Nursing	Weaning
<i>A. Phase I villages</i>			
CONT	8.5	26.6	77.0
FLIT	14.0	44.5	95.0
MCC	8.5	18.5	45.0
MCC+FLIT	13.5	40.0	63.5
<i>B. Phase II villages</i>			
CONT	29.8	23.2	99.3
FLIT	22.3	26.4	93.7
MCC	21.8	24.6	103.9
MCC+FLIT	24.5	24.2	93.3



TABLE VII: Details of violation of random sampling principles and magnitude of sample attrition (Phase I)

	Experimental treatments				Total
	CONT	FLIT	MCC	MCC+ FLIT	
<i>A. Currently pregnant</i>					
1. Total available in the village	17	23	14	19	73
2. In the sample list	16	20	14	14	64
3. Agreed to participate from the sample list	11	0	6	5	22
4. Actually participated from the sample list	11	0	5	3	19
5. Participated but not in the sample list	0	2	2	4	8
<i>B. With 0-6 months old children</i>					
1. Total available in the village	62	87	38	89	276
2. In the sample list	20	20	20	20	80
3. Agreed to participate from the sample list	9	9	9	5	32
4. Actually participated from the sample list	6	0	9	3	18
5. Participated but not in the sample list	12	1	7	6	26
<i>C. With 7-36 months old children</i>					
1. Total available in the village	146	170	101	146	563
2. In the sample list	20	20	20	20	80
3. Agreed to participate from the sample list	12	10	9	5	36
4. Actually participated from the sample list	11	4	9	5	29
5. Participated but not in the sample list	8	7	15	10	40
<i>D. Total</i>					
1. Total available in the village	225	270	153	254	902
2. In the sample list	56	60	54	54	224
3. Agreed to participate from the sample list	32	19	24	15	90
4. Actually participated from the sample list	28	4	23	11	66
5. Participated but not in the sample list	20	10	24	20	74

TABLE VIII: Per cent under-enumeration of currently pregnant women by investigators

Investigators	Per cent under-enumeration
A	7.8
B	5.4
C	23.1
D	23.7
E	28.0
F	38.6
G	41.8
H	50.4



TABLE IX: Sample attrition at different stages of study (Phase II)

Stages of study	Experimental treatments					Total
	CONT	FLIT	MCC	MCC+FLIT		
1. Planned sample size	180	—	180	—	660	
2. Participated in the bench mark survey	93.3 (168)	120 54.2	180 82.8	— 100.0 (149)	180 81.7	100.0 (529)
3. Not eligible for resurvey <sup>1</sup>	0.0	42.5	22.8	27.5	17.2	23.3
4. Not available on days of resurvey <sup>2</sup>	35.6	38.1	7.2	8.7	6.7	13.9
5. Participated in resurvey	63.3	67.8	52.2	63.1	57.8	49.1
						61.2

<sup>1</sup>Either they did not participate in the experimental programme or attended less than 25 per cent of the classes.

<sup>2</sup>Three call-backs were attempted. This category includes refusals also.

TABLE X: Some reasons for 'substitution' in the sample list (per cent and *N*) for nine villages by experimental treatments (Phase II)

	Experimental treatments			
	FLIT villages (N = 3)	MCC villages (N = 3)	MCC+FLIT villages (N = 3)	Total
<i>A. From Sample to Bench Mark Survey</i>				
Simply refused	31.1 (41)	7.0 (8)	1.5 (2)	13.5 (51)
Migrated	3.8 (5)	6.1 (7)	0.8 (1)	3.4 (13)
Husband did not give permission	3.8 (5)	0.9 (1)	—	1.6 (6)
Not available on the days of survey <sup>1</sup>	30.3 (40)	36.5 (42)	40.9 (54)	35.9 (136)
Bench Mark Survey conducted	31.3 (41)	49.6 (57)	56.8 (75)	45.6 (173)
Total in the sample	100.0 (132)	100.0 (115)	100.0 (132)	100.0 (379)
<i>B. From Motivation to Bench Mark Survey</i>				
Simply refused	28.6 (20)	4.2 (3)	2.2 (2)	10.7 (25)
Migrated	2.9 (2)	1.4 (1)	1.1 (1)	1.7 (4)
Not available on the days of survey <sup>1</sup>	10.0 (7)	15.3 (11)	15.2 (14)	13.7 (32)
Bench Mark Survey conducted	58.6 (41)	79.2 (51)	81.5 (75)	75.9 (173)
Expressed willingness to participate to motivators	100.0 (70)	100.0 (72)	100.0 (92)	100.0 (234)

<sup>1</sup>A high proportion in this group were those who had gone to their mother's house for delivery/visit.



TABLE XI: Details regarding attendance in the education classes by experimental treatments (Phase II)

Attendance in the education classes	Experimental treatments		
	FLIT	MCC	MCC+FLIT
Never attended	18.9%	0.8%	2.1%
Attended 1-9%	34.5	7.7	12.3
10-24%	22.4	8.5	7.5
25% and more	24.1	83.1	78.1
Total	100(65)	100(149)	100(147)

TABLE XII: Reasons for non-availability of respondents on the days of Resurvey (Phase II)

Reasons for non-availability	Experimental treatments				
	CONT	FLIT	MCC	MCC+ FLIT	Total
1. Migrated for work	57.6% (19)	—	53.8% (7)	83.8% (10)	60.0% (36)
2. Gone to field for work	6.1 (2)	—	—	—	3.3 (2)
3. Gone to another village for visit	6.1 (2)	100.0 (2)	38.5 (5)	8.3 (1)	16.7 (10)
4. Ill health	3.0 (1)	—	—	8.3 (1)	3.3 (2)
5. Died	3.0 (1)	—	—	—	1.7 (1)
6. Unable to locate	3.0 (1)	—	—	—	1.7 (1)
7. Refusal	21.2 (7)	—	7.7 (1)	—	13.3 (8)
Total	100.0 (33)	100.0 (2)	100.0 (13)	100.0 (12)	100.0 (60)



TABLE XIII: Distribution of women in the Bench Mark Survey (BM) and Resurvey (RS) for several variables - Phase II

Experimental treatments											
	CONT		FLIT		MCC		MCC+FLIT		Total		
	BM	RS	BM	RS	BM	RS	BM	RS	BM	RS	
1	2	3	4	5	6	7	8	9	10	11	
1. Type of House:											
a. hut	17.3	15.8	25.7	8.3	21.6	21.3	15.0	14.4	18.9	16.7	
b. kutcha	13.1	10.5	18.2	4.4	14.9	16.0	18.4	15.4	15.7	13.9	
c. mixed	1.2	1.8	12.1	8.3	4.1	6.3	9.5	7.7	5.7	4.9	
d. pucca	68.5	71.9	43.9	66.7	59.5	57.5	57.1	62.5	59.7	64.5	
2. Mean number of family members	6.7	6.8	6.7	6.1	6.7	6.5	6.8	6.1	6.5	6.3	
3. Per cent nuclear families	49.4	50.0	39.4	33.3	39.9	41.5	50.3	55.8	45.7	48.8	
4. Per cent husband literate	26.2	29.9	36.4	50.0	36.5	27.2	24.5	23.1	29.9	30.2	
5. Respondent's occupation:											
a. Non-agricultural labour	13.7	7.9	18.2	25.0	10.1	9.6	10.9	10.6	12.5	9.9	
b. Agricultural labour	72.6	78.1	72.7	58.3	77.0	81.9	75.5	76.9	74.7	78.1	
c. Traditional service	2.4	1.8	1.5	0.0	4.1	1.1	3.4	3.8	3.0	2.2	
d. Others	11.4	12.3	7.5	16.6	8.8	7.5	10.2	8.6	9.8	9.8	

(Contd.)





## CHAPTER XVI

# FIELD WORK AND DATA PROCESSING

G.N. Reddy & K. Satyanandam

The Field Personnel — Training of Investigators — Familiarisation with the Questionnaire — Contact with Potential Target Groups — Organising the First Round of Surveys: The Weekly Schedule; Coordination and Sequencing; The Village Survey; The Household Survey; The Bench Mark Survey — The Scene of Interview — Coding Scrutiny and Mailing of the Schedules — Bench Mark Survey, Phase II — Resurvey, Phase I — The Final Post-Surveys: Planning; Recruitment of Field Staff; Training of Investigators; The Field Work; Modifications in the Scheduled Pattern; Analysis of Interviewing Time, Mandays and Manhours; Coding, Scrutiny and Mailing — Computerised Data Processing: Scrutiny; Package Programmes.

### *Abstract*

In this chapter, the organisation and execution of work generally defined under the heading of 'research' is described. The project started with a number of preliminary surveys. These helped in the orientation of the research and action staff with the attitudes and problems of the people, the terrain in which we were working and the kind of difficulties we were likely to face. The manner in which the field work for data collection for Phase I and Phase II was organised and executed is described.

A FIELD OFFICE was set up in Mahbubnagar in August 1972 for carrying out preparatory studies. One Project Officer and four investigators were entrusted with the work of collecting data for the preparatory studies. This also served as a preparatory orientation and training period for data collection of the Bench Mark Survey. To start with, contacts were established with local leaders, officials and influential persons for gaining their goodwill and their cooperation. The investigators familiarised themselves with the local dialect of Telugu so as to be able to communicate effectively with the respondents. Efforts were made to take note of different words used for the same ideas by the different caste groups so that questions in a schedule could be appropriately re-worded. One of the preparatory

studies included tape-recording of words used in subjects dealing with mother and child care and food habits. In effect, this period of preparatory studies significantly reduced the time required for training the investigators and finalising the questionnaires.

### **The Field Personnel**

At the field level the staff for the Phase I Survey included six interviewers under the leadership of a Project Officer. The Project Officer had a number of functions to fulfil, besides assisting the Associate Director in pretesting and finalising the research instruments and training the interviewers. He had to manage the field work programme and guide the interview team; to edit the data and supervise the quality of coding and scrutiny, before the data were mailed to Delhi; and finally to pave the way for the smooth introduction of the action programme of the study. The person chosen for this position had earlier been associated in executing field and data processing jobs in four large-scale social surveys. He was also familiar with local dialect and with the political and social conditions in the region.

Since the needed data had to be collected from the mother and child, only female interviewers were appointed. One interviewer was made in charge of administering the Bayley's Test measuring psychomotor development of children. Another interviewer was specially trained to administer the Indian Adaptation of the Lowenfeld Mosaic Test to test the cognitive structure of the women participants. She was assisted by one more interviewer in order to keep pace with the interviewers canvassing the main schedule. The interviewers had a varied background but they were called upon to work as a team. Table I presents the social background of the interviewers.

### **Training of Investigators**

A Workshop was conducted from 12 to 19 February 1973 in Mahbubnagar where the investigators underwent training in the art of interviewing and data collection.

Besides the Associate Director and the Project Officer, one sociologist knowing the local language, the Project Officer in charge of MCC, the psychologist consultants conducting the Bayley's Test



TABLE I: Social background of interviewers (Phase I Bench Mark Survey)

S. No.	Academic field	Years of schooling	Previous experience in months	Age (Yrs)	Marital status*
1.	Psychology	17	06	29	0
2.	Social work	17	12	27	0
3.	Social work	15	30	53	1
4.	Economics	13	03	24	1
5.	Education	16	00	36	1
6.	Nursing	16	00	23	0

\*0 = unmarried; 1 = married.

and the Lowenfeld Mosaic Test and the Project statistician participated in the Workshop. The Workshop worked out standardised procedures for data collection, recording and coding so as to minimise inter-investigator variability, field editing, and coding errors.

The programme of training of the investigators was carried out in three parts. In the first part, a class-room approach was followed. Talks were given outlining the salient points of the study and the major hypotheses that were to be tested. The field experiment format of the study was explained and it was pointed out as to how it differed from other survey research methods. Further, the basic objectives of the study were analysed and discussed so that they could understand clearly the purpose of data gathering at different stages.

Lessons on interviewing techniques were given: how to build up rapport, how to maintain it and how to disengage people other than the respondent from participating in the interview situation. Talks illustrating specific problems and techniques of interviewing in the Telengana area were emphasised. These talks were followed by 'bull-sessions' in which the investigators were encouraged to share their experience in conducting interviews in this area.

Most of the investigators had some prior experience in conducting interviews in this area through their participation in the earlier surveys of this project. Problems faced earlier by individual investigators while collecting data and the manner in which they solved them were also discussed. In this process each one learned from the experiences and mistakes of the others.

### **Familiarisation with the Questionnaire**

The second part of the training was intended to familiarise the investigators with the questionnaire. For this purpose, each of the items in the questionnaire was read aloud, the concept behind every item was explained. The manner in which the response was to be recorded was emphasised. Making use of the familiarity of the investigators with the local dialect of Telugu (Mulki Telugu), the proper standardised translation of the English questions was provided so that the respondent could understand the questions easily, avoiding any further questions or explanation. This was followed by 'mock' interviews. Some took the part of the interviewers and others of the respondents. This helped the investigators to become familiar with the questionnaire. Finally, some of these interviews were tape-recorded. When these were played back, others had an opportunity to criticise the technique that was used.

### **Contact with Potential Target Groups**

In the third part of their training, the investigators were taken to nearby villages and asked to conduct some interviews. The villages selected for this were similar to the study villages in population size, caste and occupational composition. Women who were similar to the target groups in the study were contacted and interviewed. The resource persons observed the interviews and made detailed notes regarding the technique that was adopted, the difficulties, the respondents' experiences in answering questions, etc. On returning to the field office, the resource persons quickly examined the completed questionnaires. Making use of this information and the field notes, a short session was conducted where the performance of the investigators was evaluated and appropriate standardised procedures were worked out. The investigators were given an opportunity to raise questions and to identify specific questions that were troublesome. During the night, the resource persons went over the completed schedules more thoroughly and additional instructions were given before the team left for the field the next morning. This procedure was repeated for three days. On the fourth day, after a brief visit to the field, a longer session was held in the field office during which final, uniform procedures for data collection were evolved.



### Organising the First Round of Surveys

The field work was carried out using Mahbubnagar town as the base of operation. The team had to leave the field office around 5:00 a.m. in order to start interviewing in the village by 6:00 a.m. Some interviewers used to carry their breakfast while others had their breakfast in Mahbubnagar before leaving for the field. On a few occasions the team used to go to the village to conduct interviews during the evening hours. Since it was inconvenient for the whole team of six to eight members to halt in a village during the night, this strategy was abandoned. The team had already established excellent rapport at the village level. The officials, non-officials and other prominent members in the villages often invited the investigators to have lunch with them. The interviewers were thus able to plan and execute long periods of field work, whenever necessary.

*The Weekly Schedule:* The interviewers were provided with a four-wheel-drive jeep to visit the villages. The normal procedure of field work operation was to reach the field work village by 6:00 a.m. and return by 12:00 noon to headquarters. This period was considered convenient for the respondents because the interviewers were able to contact them during this time and the rest of the day was used for field-editing, coding and scrutinising the interview schedule. After the day's field work and travel by country roads, the interviewers usually got exhausted. Hence, they were asked to complete the coding at home by exchanging the schedules among themselves. Normally the interviewers would go for field work during the first three days and stay in the office on the fourth day. On this day they used to complete the final scrutiny and pack and mail the schedules. All general problems regarding their work and their difficulties used to be discussed on that day. Barring Sundays, members of the team had to work on all days in order to keep up with the field work schedule.

*Coordination and Sequencing:* Since this was an action-cum-research project, coordination and sequencing at various stages was required for the effective execution of the survey. *First*, the statistician had to select the villages for the programme. *Second*, the action team had to examine the suitability of the sampled villages for the concerned programme. *Third*, the field team had to enumerate the households and hand over the data to the statistician. *Fourth*, the project statistician had to draw a sample from the list of potential participants, and *fifth*, the action team had to contact and motivate the



sampled respondents to obtain their consent before the Bench Mark Survey could be conducted. Thus, coordination among the members of the research team and the action team was a continuing process.

Since each one of the Surveys – the Village Survey, the Household Survey and the Bench Mark Survey – is distinctive in its scope and coverage, brief reports on the mode of operation and problems encountered in each of these Surveys are presented.

*1. The Village Survey:* The Village Survey was conducted in all the sample frame villages of Mahbubnagar and Jedcherla blocks. The size of the village, distance from urban centres and health centres and accessibility were the main criteria applied for selecting the villages in the sample frame.

The survey was conducted in all the eligible villages. The schedule included certain items on socio-economic, demographic and communication characteristics of the village. In order to complete the schedule, records from the Patwari (keeper of village revenue records), Police Patel (custodian of law and order) and Sarpanch (chairman of the village council) were collected. Opinions of knowledgeable people in the village were also gathered.

The block level officials and non-officials played an important role in planning and executing the Village Survey and helped to chalk out the survey programme. The Extension Officer and/or the Village Development Officer always accompanied the investigators to the village. This was how the team could obtain needed data without much difficulty. If the data were incomplete on the date of the survey, the village officials used to mail the same to the field office at a later date. The main advantage of this survey from the field programme point of view was that it gave adequate opportunity for the initial establishment of rapport needed for ensuing surveys and for the action programme in almost all the villages in the two blocks. The village leaders were made aware of the nature of the action programme and research activities.

*2. The Household Survey:* In order to select the participants for the action programme, a Household Survey was conducted. Information and data dealing with pregnancy, lactation, and weaning had to be collected from all the adult women in the family. Since village women left for field work by 9:00 a.m., the interviewers had to contact them in the early hours of the morning. This was essential to obtain a reliable sample frame for selecting the programme participants. The field team used to give prior intimation to the village leaders regarding the survey



and would seek their assistance. Since the interviewers had very little time for locating houses and establishing rapport with the women, the village leaders provided the assistance of *Kavalikars* and other knowledgeable persons of the locality.

The village leader would divide the village into localities and assign them to the enumerators in a convenient fashion and direct the interviewers as well as the helpers. Immediately after the enumeration they would check with the helpers as well as the enumerators to make sure that the enumeration was complete. If the houses were locked, or family members had migrated or were not available during the enumeration period, data were gathered either from the male members of the family or from immediate neighbours. In such cases certain discrepancies were noticed, when the same households happened to be selected in the sample. When the list of sampled women were contacted for ascertaining their participation in the programme, at times the motivators had to make changes in the target groups and in the eligibility of some members of the households, or we had to resort to substitution.

It took 15 working days for completing the enumeration in all the nine villages. Four enumerators worked regularly. The Household Survey was initiated in the middle of January and completed by the middle of February, 1973.

3. *The Bench Mark Survey*: After completing the enumeration, three categories of eligible women were listed and the sample was drawn. The plan for the Bench Mark Survey was to select women who would be the potential participants for the action programme. We intended to interview 10 pregnant women, 10 lactating women, and 10 weaning women. While drawing the sample, 20 women were included in the order in which they were selected in each category so that we could retain 10 women from each group, who would agree to participate in the programme. The action wing of the project did not have adequate staff for conducting the motivation programme to enlist the participants for the programme. Hence, the interviewing staff contacted the potential sample of women by ascertaining their willingness to participate in the programme and thus finalised the sample list of randomly selected and willing participants.

The selected participants were fully aware of the data to be collected from them. The interviewers had, therefore, very little difficulty in administering the various tests. The interviewers made up to three call-backs of the selected participants who were not available

during the first visit. They also attempted to persuade the persons who were reluctant. This step was necessary in order to adhere to the selected list of participants for the programme and to minimise the effect of substitution.

Since there was an adequate interval of time before the introduction of the action programme, the Bench Mark Survey was carried out in Phase I quite smoothly. Three days were allotted for completing the interviews in each village. Since there were three interviewers for administering the main schedule and literacy tests and three for conducting the Bayley's Test and the Mosaic Test, all the investigators were able to complete interviewing at about the same time.

### **The Scene of Interview**

Most of the selected respondents were agricultural labourers and they were very busy in completing household duties and going out for agricultural work. Hence, they were not willing to spare the required time for interviews. Only after a great deal of persuasion would they sit and answer our questions. In fact they answered the schedule while attending to their routine duties like cooking, grinding, or breast-feeding the baby. It was, indeed, a problem to draw their complete attention to the interview situation.

Quite often the neighbours or other adult members of the family used to shout at the respondents to attend to the household work or leave for outdoor work. In some cases, neighbours present at the time of the interview would make fun of the respondent by telling her that she had been picked up for tubectomy. On such occasions, the respondent would change her mind and refuse to answer. In FLIT treatment villages, the respondents would express their unwillingness to attend classes. They often asked the interviewers to conduct classes for their children instead. Most respondents were very sceptical regarding the introduction of the action programme, as they had already met the interviewers visiting the village a number of times, during the Problem Survey, Village Survey, Household Survey and the Bench Mark Survey.

### **Coding, Scrutiny and Mailing of the Schedules**

A structured and pre-coded interview schedule for the survey was used. A few open-ended questions were included where the answers



were to be recorded verbatim. Codes were developed when a sufficient number of schedules were obtained. As soon as the interviews were completed, schedules were checked for completeness and ambiguities were clarified in the field itself. The schedules were exchanged at the coding and scrutiny stages. One final scrutiny was done before mailing the schedules.

The schedules were tagged and tied up in a certain order to facilitate the final scrutiny before punching. Specially designed envelopes were used for packing and mailing the schedules. Registered parcels were sent from the field headquarters to Delhi and all the parcels reached on time without any damage.

### **Bench Mark Survey – Phase II**

The Bench Mark schedule of Phase II was modelled after the Bench Mark schedule of Phase I. The data of Phase I were item-analysed and the adequacy of the schedules was examined. Three major changes were introduced. First, the Lowenfeld Mosaic Test which was used to measure the cognitive structure of the women was dropped. Second, the schedules that were used to record the clinical signs of nutritional deficiency was extensively modified, based on Phase I experience. Finally, appropriate codes were worked out for the open-ended questions and most of them were made into close-ended questions.

Two more investigators were engaged. The entire team of eight investigators was once again trained for the survey. As the printed schedule was available, the training was easy. Based on Phase I field work experience, the following work pattern was adopted. The investigators left for field work at 5 a.m. and returned by 11 a.m.; they came to the office at 3 p.m. and carried out coding and scrutiny operations till 5 p.m. Every fourth day was spent in the office coding the schedules. By adopting this pattern of work, it was found that the coding and scrutiny had less possibilities of error.

### **Resurvey – Phase I**

On completion of the action programme of Phase I, the Resurvey of Phase I villages was launched shortly after completing the Phase II Bench Mark Survey. Once again the investigators were trained for this survey. We expected many refusals in the CONT villages as no incentives were provided in that treatment, but to our surprise we

found that the respondents were very cooperative.

### The Final Post-Surveys

*1. Planning:* Although it was decided to launch the Post-Survey operations in February 1975, the field work was planned as early as October 1974. Based on the experience gained in the execution of the Bench Mark Surveys of Phase I and Phase II and the Resurvey of Phase I, it was decided to effect the following modifications in the field operations procedure: (1) To restructure and redesign the research instruments for sequence of the questions, so that the interviewing time, coding and punching time could be reduced and data management problems could be minimised. (2) It was also decided to recruit two teams of interviewers (each team consisting of six interviewers) so that the field work could be expeditiously completed in about two months, in order that more time may be made available for data processing and report writing. (3) For the interviewer's position, it was decided to recruit local candidates who were familiar with the local dialect of Telugu, so that problems of communication with the respondents could be minimised. In the earlier surveys we found that the investigators hailing from the other regions of the State took some time to familiarise themselves with the local dialect and idiom. Since the present assignment was for a shorter duration, it was decided that local candidates would need a shorter period of adjustment.

*2. Recruitment of Field Staff:* Although 11 investigators were employed in the earlier surveys, only two were left ultimately with the project: one got married and the other eight got permanent jobs elsewhere. Hence, 10 new investigators were needed for a short-term assignment from a backward district like Mahbubnagar. Motivating them to work in a rural area and maintaining the tempo of field work at first appeared to be a formidable task. It was decided to tackle this problem in two ways. First, to try and appoint local candidates for these positions. If suitable candidates were not available, it was decided to give a chance to the candidates from the other regions.

The first interview for the local candidates was held in the middle of December 1974. The district employment exchange was approached to suggest names of candidates and they directed 56 graduates to appear for interview. Only 25 candidates attended the interview. Before interviewing the candidates, the nature of the assignment, the



duration and the emoluments were explained to them. Six candidates were not willing to take up the field assignment. Apparently they preferred either a clerical or a teaching job. Only 19 candidates were interviewed. Our major criteria for selecting the candidates were that the candidate should have (i) a village background or some exposure to village life and knowledge of village conditions; (ii) willingness to converse with women from all castes (a secular attitude); (iii) good health and personality, and an aptitude for work in villages; and (iv) familiarity with the local Telengana dialect and a working knowledge of English. Eight candidates were judged to be moderately good for the position of investigators. Of these, only six joined the project. Another interview was conducted just before the training programme and we selected four more candidates from the other areas of Andhra Pradesh. All the ten interviewers joined the project on 20 January 1975.

*3. Training of Investigators:* There were three major factors which guided the training programme. First, we wanted to give an overall picture of the non-formal education project; second, we wanted to emphasise the importance of the post-survey from a theoretical and practical perspective; and third, we wanted to emphasise the importance of reducing the variability among the interviewers in interviewing.

On the first two days, general orientation about the project was given to the interviewers. The different components of the project, the non-formal education with basic services, the literacy classes, the feedback system and the research were discussed by the concerned Project Officers. Two interviewers were assigned to work on the Bayley's Test. The remaining 10 candidates were given training in administering the main schedule and the literacy test. The associate Director (Research), the Project Officer (Research), the Project Officer (MCC) and the Project Statistician were mainly involved in training the interviewers.

*4. The Field Work:* The regular field work commenced in the first week of February 1975. The strategy adopted was to take up the Phase I post-post survey first and proceed to the Phase II control villages and finally take up the Phase II action villages in March and complete the field work by the first week of April. Accordingly, a tentative field work programme was chalked out. It was decided that the interviewers would conduct interviews consecutively for three days in the morning from 6 a.m. to 11 a.m. and attend the office for about

two hours (3 to 5 p.m.) in the afternoon to complete the coding and initial scrutiny. On the fourth day they would stay in the office to complete the final scrutiny and mail the schedules. Thirdly, it was decided that on the first two days, a team of two interviewers would go to the same respondent. One would be interviewing and the other would be observing. The roles would be changed in the next interview. The main idea was to have a closer control over the interviewing and recording parts. This procedure was followed in the first two villages.

*Modifications in the Scheduled Pattern:* The pattern of field work planned had to be revised due to certain field problems. After completing the Phase I post-post survey, it was decided to take up the Phase II action villages. There were four reasons for changing the earlier decision. *First*, the village-based action workers reported that a number of participants were planning to migrate out of the villages and they would not be back till the monsoon. In order to avoid a reduction in our action sample size, it was decided to take up the action villages first. *Second*, the action workers reported that a substantial number of participants would be going to their mothers' homes on the eve of the Ugadi festival (Telugu New Year Day) in March. Hence, we wanted to contact them before the end of February. *Third*, the action wing had decided to complete the entire curriculum before 15 February and wanted to withdraw all the equipment. Since there would be no activity from the action wing, we decided to collect the data immediately. The literacy officer was of the opinion that if there is a long interval between the closure of the action programme and collection of resurvey data, it may affect the respondents' retention ability. *Fourth*, since ten of our interviewers were new to the field, we wanted to secure good cooperation from the participants with the help of the action workers, so that respondents would be willing to be interviewed.

As mentioned earlier, seven interviewers administered the main schedule and the literacy test. The post-post survey of Phase I villages was completed during the first and second weeks of February. The Phase II action villages were completed during the first week of April.

*Analysis of Interviewing Time, Mandays and Manhours:* Table II presents the number of interviewing days, mandays (excluding logistics) and manhours required for completing the Phase II interviews. From this table it will be seen that 24 field days were required to complete interviewing in all the 22 villages. In total, 136 mandays and 482 manhours were required to complete the entire



interviewing. The interviewers devoted on an average about three and a half hours per field day for interviewing, not including the time required to drive to and from the village.

TABLE II: Number of interviewing days, mandays and manhours for interview by type of experimental treatment (Phase II post survey)

Type of experimental treatment	No. of field days	No. of mandays	No. of manhours	No. of manhours per schedule
CONT	6	42	124	1.1
FLIT	2	9	30	2.5
MCC	8	40	129	1.4
MCC+FLIT	8	45	199	1.9
Total	24	136	482	1.2

Table II shows that it required 1.2 manhours per schedule. The literacy village interviews took the maximum time partly because the respondents took more time to complete the literacy test, followed by joint programme participants, MCC respondents and control village respondents. Since we had started with the literacy villages, the interviewers took more time. The MCC+FLIT programme village participants also took more time because of the literacy test. Since some of the supplementary questionnaire items were not applicable to the control treatment respondents, they took the least amount of time.

Table III presents the total field days, mandays, manhours required for the Phase I post-post survey. From this table we observe that the Phase I post-post survey could be completed within seven days. In total 46 mandays were required to complete the survey and the investigators spent 186 manhours in the field to collect data. When we compare the manhours required per schedule, the average manhours are higher for Phase I post-post survey (1.6) than for the Phase II resurvey (1.2). Ten of the interviewers were new when they started the post-post survey of Phase I. By the time the interviewers started the Phase II post survey, they had developed a high degree of confidence and familiarity with the schedule; the Phase II action workers also helped the interviewers in establishing rapport with the respondents. Hence, less time was taken for Resurvey than for post-post survey.

*5. Coding, Scrutiny and Mailing:* In the earlier surveys coding was done in the office. The Phase I post-post survey schedules were also

TABLE III: Interviewing time taken by treatment (post-post survey Phase I)

Type of experimental treatment	Indicators of interviewing efficiency			
	No. of Field days	No. of Mandays	No. of Manhours	No. of Manhours per schedule
CONT	2	14	59	1.5
FLIT	1	6	12	1.2
MCC	2	12	66	1.7
MCC+FLIT	2	14	49	1.9
Total	7	46	186	1.6

coded in the office. But the Phase II Resurvey schedules were coded in the field itself. Since the interviewers had to interview about three respondents on an average, they were able to complete this before 8:30 a.m., whereas in the earlier surveys the interviews were never completed before 10:00 a.m. So, it was decided to spend an hour more in the field itself to complete the coding and initial field scrutiny. If the coder, while coding, came across any irrelevant answer categories or skipped items, the interviewer could be asked to contact the respondent again for correct answers. This would reduce NA's. Before mailing the schedules, two more scrutinies were done in the office. The coder was never the same as the interviewer: a system was evolved by which schedules were distributed more or less randomly to other interviewers. From the data presented in Appendix 12, we have provided an illustration of this exchange coding.

### Computerised Data Processing

*1. Scrutiny:* It may be recalled that for coding operations, exchange coding method was adopted and was carried out in the field office. The coded schedules were further scrutinised by another investigator in the Delhi office. In spite of all these checks, it is possible that there may be coding errors in the schedules. In addition, more errors could creep in during key punching of the schedule. So, it was decided to subject the data to computerised data scrutiny programmes. Specific programmes were written up for each of the data sets. These programmes checked for alpha characters where numerics should have been, illegal codes and inconsistencies. Table IV gives the result of subjecting the data sets to these scrutiny programmes.

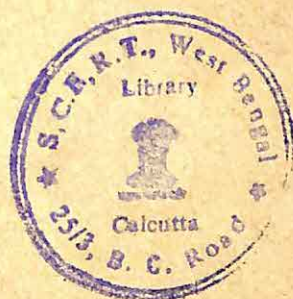


TABLE IV: Details regarding number of coding and key-punch errors detected through computerised scrutiny of data

Name of survey	No. of cards per respondent	No. of respondents	Total no. of cards	No. of key punching errors detected	No. of coding errors detected	Total no. of errors detected	Mean no. of errors per respondent.	Mean no. of errors per card
<i>Phase I</i>								
1. Resurvey	17	140	2380	73	130	203	1.45	.09
2. Post-post Survey	10	116	1160	62	100	162	1.40	.14
<i>Phase II</i>								
1. Household Survey	1	11041	11041	18	931	949	0.09	.09
2. Bench Mark Survey	20	526	10520	65	209	274	0.52	.03
3. Resurvey	11	324	3524	83	281	364	1.12	.10

It will be seen that, for example, for Phase I Resurvey, 73 key punch errors and 130 coding errors were detected. The number of key punch errors (73) for 2,380 cards was very small indeed. Further, the magnitude of key punch errors was smaller than that of coding errors. In fact this is consistently so for all the surveys. This shows that the key punching and verification of data was of high quality. The table further shows that the mean number of errors detected per respondent ranged from 0.09 to 1.45. The mean number of errors detected per card ranged from .03 to .14. These indicate that the data used in analysis were at least that much free from errors.

2. *Package Programmes:* Cards were read on to tape and variable files created for use of one or the other, of the two social science package programmes available – SPSS and OSIRIS – both at the Delhi University and the Computronics Centre (located in the Council's building). Nearly all the analyses were conducted using options available on these package programmes.





# APPENDIX 12

## Distribution of Data Schedules Canvassed by the Coders – An Evidence by Exchange Coding (Phase II Post Survey)

Investigator who canvassed the schedules	Investigator who coded the schedules							
	A	B	C	D	E	F	G	
A	—	17.6%	17.6%	23.5%	23.5%	17.6%	0.0%	100.0 (51)
B	17.3	—	15.4	13.2	21.2	25.0	1.9	100.0 (52)
C	13.1	27.7	—	23.4	8.5	17.0	4.3	100.0 (47)
D	8.7	15.2	28.3	—	19.6	17.4	10.9	100.0 (46)
E	33.3	14.3	11.9	14.3	—	16.7	9.5	100.0 (42)
F	18.2	25.0	15.9	22.7	13.6	—	4.5	100.0 (44)
G	17.9	28.2	10.3	20.5	17.9	5.2	—	100.0 (39)
Total	(51)	(57)	(46)	(57)	(49)	(47)	(14)	(321)

## CHAPTER XVII

# DESCRIPTION OF VILLAGES

**Victor Jesudason**

Phase I Villages: Census Characteristics; Household Characteristics—Phase II Villages: Census Characteristics; Household Characteristics—Summing up.

### *Abstract*

This chapter briefly describes selected demographic and socio-economic characteristics of the villages selected for both Phase I and Phase II of the study. For convenience of presentation, the selected villages are grouped according to their experimental treatments and by phases of the study. The demographic and socio-economic characteristics selected for presentation in this report will reflect our concern with maternal and child health and literacy. Although we do not intend to present theoretical basis or empirical evidence for the relevance of these characteristics, in the literature dealing with health, nutrition and education, these variables are often identified as correlates of maternal and child health and literacy.

ONE OF THE important requirements of a 'good' field experiment is that the participants (or subjects) in the various experimental treatments should be homogeneous on variables that are related to the independent variable that is being manipulated. Based on the assumption that the characteristics of a village as a whole will have an impact on the characteristics of the individuals in the village, it is appropriate to enquire whether or not villages that are in different experimental treatments are similar. So, when we present data, the interpretation of the data will centre around the question whether the villages are similar. We will simply compare the characteristics of villages in an experimental treatment with villages in another experimental treatment to examine whether they are similar.

### **Phase I Villages**

*Census Characteristics:* This report makes use of two sources of data



to describe selected villages of Phase I as given in the Census Reports of 1961 and 1971. From Table I (see Appendix 13) it will be seen that the mean number of households in all the four experimental treatments were more or less similar for both the census years. In 1961 it ranged from 202 households in MCC villages to 312 households in FLIT villages. The mean was 261 households. When we examine the percentage of increase from 1961 to 1971, there are variations among the villages in different treatments. The MCC villages with the lowest number of households in both the decennial census years have registered the lowest increase (4.46 per cent) among all the four groups. The highest increase of 27.29 per cent is recorded in MCC+FLIT villages. But, when we examine the population increase from 1961 to 1971, the villages in all the four treatments were more or less similar.

In other words, the lowest increase with regard to households registered in the MCC villages was not reflected in the increase in population. Further, when we examine the total population and the total female population in all these four treatments, they are fairly similar. We can state that in these villages for various indices related to population, there are some variations. But they exhibit an irregular pattern. We are not able to infer any systematic variations. Whatever variations there may be, they appear to be random.

Two measures of socio-economic status are made use of in Table I, viz., female literacy rates and female labour force participation rates. On these two measures the villages in all the four experimental treatments are similar. In general, the table reveals that the villages in all the four experimental treatments were similar with regard to selected census reported demographic and socio-economic characteristics. Although there were a few variations, they appear to be random and not likely to cause a bias.

*Household Characteristics:* Table II (see Appendix 13) documents selected characteristics of villages in the first phase of the study. With regard to religion, the villages in all the four experimental treatments are similar. In terms of the caste composition of these villages, except for MCC+FLIT villages, all the other three groups were similar. MCC+FLIT villages have a higher proportion of both scheduled castes and upper castes than the other three treatments. This is also reflected in the level of housing available. Further, MCC+FLIT villages have a larger proportion of houses with thatched roof (one room) than the villages in the other three treatments. On the other



hand, when we examine the occupational structure of these villages, we find that the villages in all the four treatments were similar. To summarize: in Table II we made use of three measures of stratification hierarchy. We find on two of them, viz., caste, type of house, FLIT and MCC villages have both the upper and lower ends represented in a higher proportion than the villages in the other three treatments; with regard to the third measure of stratification, viz., occupation, all the four treatments were similar.

We make use of six demographic indicators in the table, viz., type of family (nuclear/other), average family size, average number of women in the reproductive age-group (14-45 years of age) per household and average number of children per household. In all these measures, the villages in all the four experimental treatments were remarkably similar. For example, with regard to average number of women in the reproductive age-group per household, there are 1.17 women in control villages, 1.19 in functional literacy villages, 1.18 in MCC villages, and 1.27 in functional literacy and MCC villages. The differences seem to be small and not significant.

## Phase II Villages

*Census Characteristics:* Table III (see Appendix 13) gives selected characteristics of the selected villages of Phase II of the study as provided in the Census Reports of 1961 and 1971. It will be seen from the table that the mean number of households in all the four experimental treatments was more or less the same. But there were variations in the percentage of increase between 1961 and 1971. The villages in the FLIT treatment registered the lowest increase (2.5 per cent) and the villages in the MCC treatment registered the highest increase (12.1 per cent). On the other hand, when the population increase between 1961 and 1971 is examined, it is seen that the FLIT villages registered the highest increase (18.6 per cent) and the MCC villages the lowest (8.5 per cent). This increase in population was reflected in, or may be explained by, increase in female population between 1961 and 1971. In other words, the lowest increase in households in FLIT villages was not reflected in population increase in those villages. In any case, the differentials were so minor that they can be ignored. When the socio-economic characteristics like female literates and female workers of the villages in the four experimental treatments were examined the villages were more or less similar.



*Household Characteristics:* Table IV (see Appendix 13) displays selected household characteristics of the villages in the Phase II of the study. If the level of socio-economic status of a village could be indexed by the type of building material of the houses, the table shows that the villages in all the four experimental treatments were similar. The percentage of pucca buildings range from 58.7 per cent in FLIT villages to 69.2 per cent in the CONT villages. In terms of the caste composition of the villages, the FLIT villages have a slightly higher proportion of backward castes when compared to other three treatments. But on all other variables presented in the table, the villages in the four experimental treatments were very similar. Examining the two Tables (III and IV) together, one may conclude that the villages selected for the four experimental treatments were more or less similar.

### **Summing Up**

In this chapter selected demographic and socio-economic characteristics of the villages in both phases of the study are presented. The data were from two sources, namely, the Census Reports and the Household Surveys conducted for this study. The tables were examined to see whether there were any systematic variations among the villages in different experimental treatments. Although there were a few variations, they appear to be minor and non-systematic. So, it is concluded that the villages in the various experimental treatments were homogeneous.

# APPENDIX 13

TABLE 1: Selected demographic and socio-economic characteristics from Census Reports of villages selected to participate in the first phase of the study by type of treatments

Selected characteristics	Type of experimental treatments				Total
	CONT	FLIT	MCC	MCC+ FLIT	
1	2	3	4	5	6
1. Mean number of household					
a. 1961	286	312	202	245	261
b. 1971	310	361	211	312	299
c. Per cent increase (1961-71)	8.39	15.86	4.46	27.29	4.30
2. Mean population (per village)					
a. 1961	1403	1622	1092	1153	1293
b. 1971	1636	1823	1207	1447	1528
c. Per cent increase (1961-71)	16.61	12.33	21.68	25.44	18.17
3. Mean female population (per village)					
a. 1961	704	822	501	606	658
b. 1971	819	898	588	723	757
c. Per cent increase (1961-71)	16.34	9.25	17.37	19.21	15.05
4. Females per 1000-males					
a. 1961	1006	1027	1021	1109	1038
b. 1971	1003	971	951	999	982
5. Female literates as per cent of total females					
a. 1961	2.70	4.01	2.00	3.54	3.17
b. 1971	3.60	4.60	4.84	3.32	4.07
6. Mean female workers					
a. 1961	397	466	261	311	359
b. 1971	308	317	145	120	222
c. Per cent decrease	22.52	32.05	44.44	61.48	38.04
7. Female workers as per cent of total workers					
a. 1961	31.52	46.70	43.90	46.91	40.83
1971	37.72	35.53	28.91	21.24	32.07

Source: Census of India, 1961 and 1971. *District Census Handbook: Mahabubnagar District*, Hyderabad. The Director of Printing, Government of Andhra Pradesh.



TABLE II: Selected household characteristics of villages selected to participate in the first phase of the study by experimental treatments

Selected household characteristics	Experimental treatments				Total
	CONT	FLIT	MCC	MCC+ FLIT	
1	2	3	4	5	6
1. Per cent Hindu	96.6	93.8	91.8	97.7	94.5
2. Caste:					
Scheduled	24.9	21.1	18.4	27.2	22.2
Backward	64.6	68.8	68.2	50.1	64.5
Upper	10.5	10.9	13.4	21.7	13.2
3. Occupation:					
Agriculture	60.6	73.2	61.8	66.0	65.9
Non-farm labour	13.6	10.1	12.7	16.8	12.7
Traditional service and artisans	18.5	4.8	9.2	7.8	9.7
Shopkeeper, other services	7.3	11.9	16.3	9.4	11.7
4. Type of House:					
Thatched	16.8	17.6	28.3	43.0	24.4
Thatched with more than one room	11.6	19.6	27.3	26.3	21.0
Tiled house	31.8	3.5	6.9	5.5	11.3
Pucca building	39.8	59.3	37.3	25.2	43.3
5. Per cent nuclear	54.2	59.3	66.8	58.9	60.2
6. Family size:	$\bar{X}$ 5.38	5.37	5.55	5.65	5.47
	SD 2.78	2.65	3.14	3.47	2.96
7. Number of couples per household	$\bar{X}$ 1.23	1.21	1.25	1.26	1.23
8. Age of wife:	$\bar{X}$ 30.94	24.07	30.56	29.03	30.33
	SD 10.26	10.85	11.30	10.81	10.89
9. Women in the reproductive age-group per household	1.17	1.19	1.18	1.27	1.20
10. Total number of children per household:	$\bar{X}$ 3.11	3.27	3.34	3.30	3.26
	SD 2.41	2.51	2.47	2.80	2.52
11. Per cent non-migrants	88.8	84.9	78.0	77.8	82.8

TABLE III: Selected demographic and socio-economic characteristics from Census Reports of the villages selected to participate in the second phase of the study by type of experimental treatments.

	Experimental treatments				Total
	CONT	FLIT	MCC	MCC+ FLIT	
1	2	3	4	5	6
1. Mean number of households:					
a. 1961	269	245	257	282	265
b. 1971	286	251	288	313	289
c. Per cent increase (1961-71)	6.32	2.45	12.06	10.99	9.06
2. Mean population:					
a. 1961	1299	1107	1244	1410	1279
b. 1971	1351	1313	1350	1560	1410
c. Per cent increase (1961-71)	4.00	18.61	8.52	10.64	10.24
3. Mean female population:					
a. 1961	664	564	637	707	650
b. 1971	691	661	674	772	706
c. Per cent increase (1961-71)	4.06	17.20	5.81	9.19	8.61
4. Females per 1000 males:					
a. 1961	1047	1039	1050	1006	1033
b. 1971	1048	1013	997	980	1004
5. Female literates as per cent of total female population:					
a. 1961	3.00	4.74	3.70	3.20	3.50
b. 1971	5.10	4.77	4.82	4.62	4.90
6. Mean female workers:					
a. 1961	341	335	362	358	350
b. 1971	305	364	295	335	318
c. Per cent change	-10.55	+8.67	-18.50	-6.42	-9.14
7. Female workers as per cent of total workers:					
a. 1961	47.02	48.12	46.67	43.90	46.19
b. 1971	43.50	48.62	41.45	40.60	42.24

Sources: Census of India, 1961, *District Census Handbook: Mahbubnagar District*, Hyderabad: Govt. of Andhra Pradesh, 1966.  
 Census of India, 1971, *District Census Handbook: Mahbubnagar District*, Hyderabad: Govt. of Andhra Pradesh, 1975.



TABLE IV: Selected household characteristics of villages selected to participate in the second phase of the study by experimental treatments

Selected household characteristics	Experimental treatments				Total
	CONT	FLIT	MCC	MCC+ FLIT	
1	2	3	4	5	6
1. Type of house:					
a. Hut	17.6%	20.2%	20.2%	16.7%	18.5%
b. Thatched	13.0	21.0	15.7	15.0	16.2
c. Pucca building	69.2	58.7	64.1	68.3	65.2
2. Caste:					
a. Non Hindu	2.4	2.4	5.2	6.1	4.2
b. Scheduled caste	22.5	16.5	19.7	21.9	20.5
c. Backward caste	54.6	73.4	63.0	63.2	62.7
d. Upper caste	20.6	7.4	12.0	8.8	12.5
3. Occupation:					
a. Agriculture	49.2	61.2	46.8	50.6	49.3
b. Farm labour	15.7	13.9	18.3	16.1	15.4
c. Non-farm labour	17.2	11.6	14.4	11.1	14.1
d. Others	17.9	13.3	20.5	22.2	21.1
4. Family size:	$\bar{X}$ 5.51	5.58	5.56	5.77	5.61
	SD 5.05	0.18	6.98	6.99	6.34
5. Type of family:					
a. Nuclear	50.1	51.7	52.6	49.0	50.8
b. Joint	36.7	39.0	37.4	40.4	38.4
c. Others	13.2	9.4	10.0	10.6	10.9
6. No. of couples per household	$\bar{X}$ 1.21	0.97	1.20	1.28	1.23
	SD 0.90	0.70	0.94	0.93	0.92
7. No of women in the reproductive age per family	$\bar{X}$ 0.98	0.97	0.97	1.00	0.98
	SD 0.70	0.70	0.68	0.68	0.69
8. Total number of children per household	$\bar{X}$ 2.70	2.58	2.59	2.81	2.68
	SD 2.52	2.31	2.51	2.48	2.47

## CHAPTER XVIII

# RETROSPECTIVE PREGNANCY HISTORY OF WOMEN

**Rajni Shirur**

General Description of the Data: A Mean Pregnancy of 4.1 — Effective Married Years and Fertility — Fertility Determinants: Age at Marriage; Age at Marriage by Caste Groups; Age at Marriage and Reduction of Births; Incidence of Separation or Divorce; Death during Pregnancy or Delivery — Vital Rates: Sex Ratio at Birth; Changes in Sex Ratio; Decline in Sex Ratio; Outcome of Pregnancies by Parity; Outcome of Pregnancies by Current Age of Mothers — Causes for Deaths of Infants and Children — Morbidity during Pregnancy — Spacing between Pregnancies — Cohort Analysis.

### *Abstract*

In this chapter, selected demographic characteristics of the women who agreed to participate in Phase II of the study are presented. As the primary concern of this study was maternal and child health and nutrition, the demographic characteristics selected for presentation in this chapter pertain mainly to the pregnancies and their outcome. As the data relating to pregnant women were of retrospective nature and the data collection procedure relied heavily on the memory of the respondents, these were subject to recall relapse, and hence the magnitude of under-reporting is unknown. Nevertheless, many precautions were taken to elicit the various ages accurately by counter-checking with important family and neighbourhood events and/or festivals in the area and tallying them with the Hindu Calendar. The investigators were specially trained to probe and aid recall of pregnancies. It is, therefore, assumed that errors due to recall may not be large.

THE DATA PRESENTED in this chapter pertain to all the 586 women who participated in the Bench Mark Survey of Phase II. In other chapters, the data were analysed and presented according to the experimental treatments. However, no such groupings are attempted in this chapter. As the major objective of collection, analysis and presentation of retrospective pregnancy history was to study the trends and patterns of fertility of these women and mortality of infants



and children among these women, no attempt has been made to group the data according to experimental treatments. Further, because of the sampling procedures adopted to draw the sample, it is assumed that the women in all the four experimental treatments were similar before the start of the experimental manipulation.

### **General Description of the Data**

The reproductive age span of women has conventionally been considered as between 15 and 45 years. However, a woman's fertility is influenced by other factors such as age at marriage, consummation of marriage, duration of marital life within the reproductive age span, the incidence of widowhood among women of reproductive age, and customs regarding remarriage of widows. Some of these factors are discussed here in detail with specific reference to the population studied.

The utility of mortality statistics for planning public health programmes and other public utility services is indisputable. Hence, observations are also presented on the mortality patterns in infancy and childhood, causes of mortality, paritywise mortality observed in the sample, relations between age of mothers and outcome of pregnancies, and influence of inter-pregnancy interval on the outcome of pregnancies.

Of the 586 women studied here, all were in the reproductive age span of 14-48 years. Only 9 women did not have any children although they were pregnant at the time of the survey. And about 2 per cent of women had reported their age at first pregnancy to be 13 years. About 53.3 per cent of women in this survey had their first pregnancy before the legal age at marriage, i.e., 16 years. Seventy-four per cent of women in the sample were below the age of 30 years.

*A Mean Pregnancy of 4.1:* Table I gives the age composition of the women studied and per cent pregnancies along with mean number of pregnancies and live-births reported by them. The maximum per cent pregnancies reported were in the age-group of 24-28 years followed by the age-group of 29-33 years. More than half the pregnancies reported were in the age-group of 24-33 years. Even though the per cent women in the two age-groups 19-23 and 24-28 were more or less same, the reported pregnancies were maximum in the age-group 24-28. However, the fertility level was the highest in the next age-group of 29-33 than the earlier age-groups considering the number of



TABLE 1: Age composition of the women in the sample and per cent pregnancies reported along with mean number of pregnancies and live-births in different age-groups

Age-groups (present age in years)	Per cent women in each age- group	Per cent reported pregnancies	Mean no. of pregnancies per mother	Mean no. of live-births per mother
14-18	13.6	4.1	1.2	1.2
19-23	26.4	16.1	2.5	1.9
24-28	27.3	27.7	4.1	3.0
29-33	16.7	23.9	5.8	4.1
34-38	11.5	19.7	7.0	5.0
39-43	4.1	7.9	7.9	5.3
44-48	0.4	0.6	7.0	5.5
Total	100.0 (586)	100.0 (2389)	4.1	3.9

women composing these groups.

It is evident from the table that about 86 per cent of the women in the study are still in the reproductive years. Only 16.7 per cent of the women in the survey had reported a little less than one-fourth of the total pregnancies, thus yielding a mean pregnancy of 5.8 per mother for this age-group. The total number of pregnancies reported by 586 women, up to the time of the survey was 2389, yielding a mean pregnancy of 4.1. The mean number of pregnancies and live-births in different age spans are given in Table I. It is not surprising that the mean number of pregnancies and live-births per mother increased according to their ages. The mean number of children born to women between 19 and 23 years was 2.5 and this increased to 4.1 for the women between 24 and 28 years, and to 5.8, 7.0, 7.9 and 7.0 for the later age spans respectively. It appears that the mean number of children born tapers off after the women cross 34 years of age. However, the rate of increase in pregnancies as well as in the two consecutive age spans from 19-23 to 24-28 and from 24-28 to 29-33 is more or less similar and is also high.

According to columns 4 and 5 of Table I, we observe that initially for the women in the age-group of 14-18 years, there is no difference in the mean number of pregnancies and live-births. However, the difference between the pregnancies and live-births appears in the next



age-group (19-23 years) and the gap widens as the age increases and so also the pregnancies. In other words the higher the age of the women, larger the number of pregnancies and lesser the number of live-births.

### **Effective Married Years and Fertility**

The age at marriage and consummation of marriage are of great significance in determining the level of fertility of the population. These determine the total married years which has a direct bearing on fertility. Table II indicates the percentage of women studied, mean number of pregnancies and live-births according to total effective married years. The total effective married years are computed from the consummation of marriage to the present age of the women in the sample. It is obvious from Table II that only 13.4 per cent of the women had completed more than 20 years of effective married years and the increase in mean number of pregnancies tapers off after 20 years of completed effective married years. It is also clear from the table that the women covered in this survey had not completed their fertility. About 40 per cent of the women have completed only less than 10 years of effective married years. The mean number of pregnancies for women with over 25 years of completed married years was 7.7 and for those above 20 years it was 7.4. We can interpret from the table that roughly one pregnancy had occurred to each

TABLE II: Per cent women in the sample, mean number of pregnancies and live-births according to total effective married years

Total effective married years	Per cent women	Mean pregnancies	Mean live-births
Less than 5	17.3	1.5	1.4
6-10	26.1	2.8	2.6
11-15	26.0	4.4	4.2
16-20	17.2	5.9	5.8
21-25	9.4	7.4	7.0
More than 25 years	4.0	7.7	7.4
Total	100.00 (577)	4.1	3.9

women for every three-year period. It is also likely that the mean number of pregnancies for the women in the sample would possibly increase to 7 or more from 4.1.

Mean number of children died in respect of these 586 women was 0.9. One-fourth of the women had lost at least one child each and about 14 per cent of them had lost two children each. Only half of these women did not lose any child. Nearly 6 per cent of these women had lost four or more children.

TABLE III: Per cent women in different age-groups according to number of parities

Age-group (years)	No. of women	Parities			Total
		2 and less	3 and 4	5 and above	
14-18	80	88.7	2.5	0.0	100.0
19-23	155	56	37.4	5.8	100.0
24-28	160	14.3	46.9	38.1	100.0
29-33	98	3.1	24.5	72.4	100.0
34-38	67	1.5	12	86.5	100.0
39-43	24	0.0	0.0	100.0	100.0
44-48	2	0.0	0.0	100.0	100.0
Total	586	31.3	28.6	38.5	100.0

Table III details the percentage of women in different age-groups according to the number of parities. It is obvious from the table that nearly half the women in the age span of 24-28 years have had already 3 or 4 children and a little less than three-fourths of the women in the age span of 29-33 are already having five or more children.

### Fertility Determinants

The fertility pattern of women in respect of age for any population depends on various factors. These are: age at marriage, age at consummation of marriage, incidence of widowhood among women of reproductive age, customs regarding remarriages and the extent to which married couples practise diverse forms of fertility control. Some of these factors are discussed below.

1. *Age at Marriage:* The reported mean age at marriage of the



women in this survey was 10.8 years which is significantly lower than those that were reported in other studies. About 97 per cent of women in this survey were married before they were 16 years, which is the legal age of marriage. Shadnagar study<sup>1</sup> conducted in the same district (Mahbubnagar) in 1972 showed that in the age-group 10-14, 25.7 per cent of females were married and 88.7 per cent were married in the 15-19 age-group. The mean age at marriage for girls in rural areas is 16.7 years (for all-India) according to 1971 Census. The mean age observed in this survey is considerably low compared to 1971 Census figures.

2. *Age at Marriage by Caste Groups:* Caste status has also been considered an important determinant of age at marriage. The minimum age at marriage among the scheduled and the backward castes was 3 years while it was 5 for upper castes. In Table IV mean age at marriage according to caste grouping is given. It is evident from the table that the upper castes had a slightly higher mean age at marriage than the scheduled castes and backward castes, the latter having the lowest mean age at marriage. Percentage distribution of women's age at marriage by caste is also given in Table IV. A larger percentage of women (16.3%) were married between 15 and 18 years among the upper castes compared to other caste groups. Similarly we find the smallest percentage of women who were married before they were 7 years.

3. *Age at Marriage and Reduction of Births:* Agarwala<sup>2</sup> has shown that there is a definite negative correlation between age at

TABLE IV: Per cent distribution of women's age at marriage by major caste groups and their mean age at marriage

Age at marriage (years)	Scheduled castes	Backward castes	Upper castes	Total
Less than 7	2.2	9.5	1.4	7.3
7-10	38.8	39.1	21.8	36.8
11-14	54.8	45.3	60.9	48.8
15-18	4.4	5.9	16.3	7.0
Total	100.0 (93)	100.0 (419)	100.0 (74)	100.0 (586)
Mean age at marriage	11.0	10.0	12.0	10.8

marriage and fertility. He points out that on an average, one less child will be born to every married women if the age at marriage is 23 or above as compared to below 18. It has been estimated that raising the age of marriage to 21 years may reduce fertility by 10 to 30 per cent.

Table V indicates the mean age at marriage for different age cohorts of the women in the Survey. The perusal of mean ages at marriage for different age cohorts of women indicates that there appears to have occurred a gradual change in female age at marriage over three to four decades in the area studied. While the mean age at marriage for women of 14-18 years was 11.2, women of 34-38 years had a mean age of 10.2 and a further fall in the mean age to 9.0 for the women of 44-48 years.

TABLE V: Mean age at marriage for women in different age groups

Current age (years)	No. of women	Mean age at marriage	S.D.
14-18	80	11.2	2.6
19-23	155	11.0	2.6
24-28	160	10.9	2.9
29-33	98	10.5	2.5
34-38	67	10.2	2.8
39-43	24	10.0	3.3
44-48	2	9.0	1.4

4. *Incidence of Separation or Divorce:* In the study population, 1.2 per cent of wives were either separated or divorced. And 5.8 per cent of the women were second wives while the first wives were alive and were living either separately or in the same house.

5. *Death during Pregnancy or Delivery:* Though it was primarily not planned to collect this information, it was reported that during pregnancy or during delivery, 2.4 per cent of the women who were first wives were reported to have died and another 1.5 per cent of the first wives had died within a month after delivery.

## Vital Rates

1. *Sex Ratio at Birth:* Sex ratio at birth is considered to be a biologically determined factor. On the basis of several empirical studies, numerical preponderance of male births over female births



have been claimed. 'It has been the experience in almost all parts of the world that more male babies are born than female (105 male births for every 100 female births).<sup>3</sup> Some of the factors said to be influencing the sex ratio at birth are race, climate, season of gestation, food, consanguineous marriage, polyandry etc.'<sup>4</sup> One study which collected data on sex ratio of births occurring in hospitals and health centres during, 1949-58, reported that there is no factual basis for the hypothesis that a higher masculinity at birth in India accounts for the excess of males in the population.<sup>5</sup> Based on the information obtained from hospitals and health centres throughout the country during the period 1949-58, Ramachandran and Deshpande<sup>6</sup> obtained all-India average of 106 male live-births to 100 female live-births. The sex ratio at birth in this study was in favour of female babies, which accounted for 998.2 male babies per 1000 female babies.

2. *Changes in Sex Ratio:* It has been the general belief that female babies are subjected to greater neglect than their male counterparts. This is because sons are considered to be a potential source of economic support while the daughters are looked upon as liabilities.

TABLE VI: Per cent distribution of deaths of children at different ages by sex

Sex of child	Age of children at death			Total
	Below 1 year	1-5 years	5+ years	
Male	52.2	45.1	56.2	50.0
Female	47.8	54.9	43.8	50.0
Total	100.0 (291)	100.0 (202)	100.0 (48)	100.0 (541)

Table VI indicates mortality of children at different periods of their lives by sex. From the table it will be seen that the risk of dying was more in the case of male infants below one year than in the case of female infants. However, this picture was reversed later by more female children dying during the ages 1-5 years than male infants. The mortality of male children was much higher after 5 years of age than earlier. However, overall mortality rates of children according to sex as indicated in column 5 of the table point out absence of any difference.

3. *Decline in Sex Ratio:* The decline in the sex ratio in the age-group of 1-12 years in India is attributable to the higher mortality among girls than among boys.<sup>7</sup> The sex ratio at the time of the survey had declined to 987.6 per 1000 males from 1001.7 female babies per 1000 males babies at birth.

TABLE VII: Per cent distribution of live-births according to sex and parity

Parity order	Live-births (at term and premature)		Total
	Male	Female	
1	48.1	51.9	100.0 (563)
2	51.8	48.2	100.0 (476)
3	51.4	48.6	100.0 (379)
4 and above	50.0	50.0	100.0 (899)
Total	49.9	50.1	100.0 (2274)

Table VII gives the per cent distribution of live-births according to sex and parity. The common belief is that there is a greater tendency for the first born children to be male than the later born children. For this sample, it was found that female live-births in the first parity were slightly more than male live-births. However, this ratio was altered in favour of male births in the second and third parities to a similar extent. And the latter parities did not show any difference in the birth of male and female babies. Among the total live-births in the sample, female births were more only to the extent of 0.2 per cent which is very small. About 65 per cent of the reported still-births in the survey were males. Possibly the larger percentage of male still-births had affected the male-female ratio at birth in favour of female babies in our study.

4. *Outcome of Pregnancies by Parity (wastage of pregnancy):* Pregnancy wastage is assessed by the occurrence of abortions, miscarriages and still-births. Outcome of pregnancy by parity is detailed in Table VIII. The pregnancy wastage was comparatively higher in the first parity and reduced to some extent during second and



TABLE VIII: Outcome of pregnancy by parity order

Parity order	Pregnancy wastage	Live-births (at term and premature)	Total pregnancies
1	5.2%	94.8%	577
2	4.8	95.2	491
3	4.8	95.2	392
4	4.2	95.8	306
5	4.0	96.0	225
6	5.4	94.6	165
7 and above	5.0	95.0	233
Total	4.8	95.2	2389

third parities and further reduced during fourth and fifth parities. However, the wastage of pregnancy had increased again after the fifth parity. The present observations are also contrary to what was reported by the Delhi Urban Community Study,<sup>8</sup> where wastage increased with the parity. Similarly, mortality of children by parity is given in Table IX. One out of every four children born had died in this sample. It is also seen that the later born children have a larger survival probability than the earlier born ones. The mortality rate was highest in the first born and was considerably reduced in the second and third parities and it was further reduced in the fourth, fifth and sixth parities. The survival probability was maximum for the later borns, particularly in 7 and above parities where the mortality rate observed was minimum.

TABLE IX: Mortality of children by parity order

Parity order	Live-births	Mortality	Survival
1	547	36.5%	63.5%
2	467	26.1	73.9
3	373	27.6	72.4
4	293	23.2	76.8
5	216	20.8	79.2
6	156	18.5	81.5
7 and above	222	11.7	88.3
Total	2280	24.0	76.0

5. *Outcome of Pregnancies by Current Age of Mothers:* Table X indicates the outcome of pregnancy by mother's age. It is apparent that the pregnancy wastage was high when the mothers were 16 years and below, and as the age of the mothers increased, live-births were increased and pregnancy wastage was reduced to the minimum up to the age of 31 and again it increased at the later age spans of 32 to 48 years. Wallace and Gold<sup>9</sup> have observed a direct relationship between maternal age and the outcome of pregnancy, the younger the age, the less favourable the outcome. 'Teenage pregnancy carries with it such concerns as the nutritional needs of mother, foetus and the child, increased complications such as toxemia, delayed parental care with the consequences.' Our observations also agree with the above findings. This is again a valid argument in favour of strictly enforcing legal age at marriage as well as shifting the legal age at marriage of females from 16 to 18 years. It would possibly lead to postponement of conceptions resulting in reduction of not only the birth rates but also foetal losses and infant mortality.

TABLE X: Outcome of pregnancies by current age of mothers

Current age (years)	Pregnancy wastage	Live-births	Total preg- nancies
Up to 16	7.2%	92.8%	367
17-21	5.1	94.9	879
22-26	4.0	96.0	595
27-31	3.6	96.4	339
32-36	5.0	95.0	163
37-48	14.0	86.0	46

The high mortality rate observed in earlier parities highlights the need for provision of more health and medical services for infants and children and also well-planned health and nutrition education programmes for mothers in the earlier parities.

Table XI gives the weighted average rates of pregnancy outcome computed for every five-year period between 1953 and 1973. It is necessary to clarify the point that the years indicated in these tables are only estimated years and may not be the actual year of occurrence. The year of occurrence was estimated by computing the difference between the present age of the mother and the age at each



TABLE XI: Weighted average outcome of pregnancies (per 1000 pregnancies) by years of pregnancy

Year of pregnancy	Abortions and miscarriages	Still-births	Pregnancy wastage	Prematurity	Live-births	Total pregnancies
1953-57	48	22	70	9	921	179
1958-62	26	21	47	21	932	343
1963-67	23	19	42	26	932	649
1967-71	32	20	52	15	933	925

pregnancy. It is obvious from Table XI that the pregnancy wastage during the period 1953-57 was larger and live-births lesser than during 1958-72. Though no significant difference in the wastage is observed between periods 1958-62 and 1963-67, the rate had considerably increased during the period 1968-72. However, the prematurity rate was much lower in the period 1968-72 than during the early decade 1958-67. In general, we may conclude that no changes appeared to have occurred during the period 1958-72 in pregnancy wastage or prematurity or live-birth rates.

TABLE XII: Weighted average mortality rates of infants and children (per 1000 live-births) by year of birth

Year	Neo-natal mortality	Post-natal mortality	Infant mortality	Child mortality			Live-births
				1-3 yrs	3-5 yrs	5+ yrs	
1952-56	135	105	238	135	16	63	125
1957-61	125	58	183	81	58	27	295
1962-66	108	75	183	78	47	30	524
1967-71	53	34	87	54	15	11	858

Selected mortality rates were grouped for five-year periods and are presented in Table XII. By using the weighting procedure, the rates of mortality were computed for every five-year period for 1952-1971 as classified and indicated in Table XII. It is obvious from the table that infant mortality and child mortality between 1 and 3 years was particularly higher than during the five-year periods of 1957-61 and

1962-66 as well as 1967-71. There had been a progressive fall in the infant and child mortality rates in 1952-1971. During 1967-71, we find significantly lower infant and child deaths when compared to all other periods. The infant mortality rate of 87 per 1000 live births during 1967-71 is very much lower than the all-India or Andhra Pradesh average referred to earlier.

### **Causes for Deaths of Infants and Children**

Of the total live-births (2229) relating to the women in the Survey, only 76 per cent of the children survived and 24 per cent of those born alive were already dead at the time of the Survey. In other words, only 76 children out of every hundred born had the chance of survival beyond their childhood.

The major causes of death in the early childhood are those characterised by the post-neonatal period of infancy where infection and malnutrition, individually or in combination, play a major role. Of the 548 deaths of children reported to have occurred, there were different causes attributed to these deaths. The major causes of deaths and per cent deaths are given in Table XIII. The analysis of these causes as reported by mothers reveal the following interesting points. A significant proportion of deaths could have been avoided as they were largely due to socio-cultural consequents. For example, vaccinating infants and children at the appropriate time could have prevented such diseases as smallpox, polio, tetanus, cholera, etc. It was unfortunate that 5.3 per cent of deaths had occurred due to lack of mothers' care. Majority of mothers in this sample were going to the field for work and consequently babies were left to the care of older siblings. Reasons for 13.9 per cent of deaths could not be obtained due to mothers' inability to state the reasons for death. Accidents formed about 2.7 per cent of mortality. 'Nanju', the disease caused by protein-calorie malnutrition alone had caused 12.4 per cent of deaths among children in this sample as reported by mothers. Probably one would expect a greater proportion of deaths due to protein-calorie malnutrition in the population. And a little less than one-fourth of deaths were reported to have been due to diarrhoea, dysentery, etc. Thus, over one-third of the deaths could possibly be attributed to infection and malnutrition.



TABLE XIII: Per cent mortality of children by different causes as reported by mothers

Cause of mortality	No.	%
1. Diarrhoea, dysentery, stomach pains, etc.	132	24.1
2. Nanju - P.C.M. (protein-calorie malnutrition)	68	12.4
3. Fevers and 7-day fevers	63	11.5
4. Communicable diseases (like smallpox, polio, measles, tetanus, etc.)	47	8.6
5. Congenital abnormalities	29	5.3
6. Convulsions	20	3.6
7. Loss of eyesight with general swelling of the body	6	1.1
8. Cholera	5	0.9
9. Typhoid	3	0.5
10. Coughs and colds	6	1.1
11. Evil spirits	17	3.1
12. Accidents such as falls, burns, drowning and other mishaps	15	2.7
13. Lack of mother's care	29	5.3
14. Miscellaneous	32	5.8
15. Ill-defined or 'do not know'	76	13.9
Total	548	100.0

### **Morbidity during Pregnancy**

Morbidity during pregnancy by parity along with the duration of morbidity is given in Table XIV. A higher morbidity rate was reported during the first two parities and there was no consistency in the morbidity pattern in the later parities as reported by the women in the study. More than 50 per cent of the reported morbidity during pregnancy was for more than eight weeks' duration.

### **Spacing between Pregnancies**

It would be of interest to examine the age at which the first conception had taken place and the time intervals between pregnancies. The mean age at first pregnancy was 16.7 years and about 59 per cent of the women had their first pregnancy between the ages of 15 and 17 years. About 13 per cent of the women had the pregnancy between 12 and 14 years. The mean interval between the first and the second and the

TABLE XIV: Per cent women reporting morbidity during pregnancy and its duration by parity order

Parity order	Reported No.	Morbidity %	Duration of morbidity	
			Less than 8 weeks No.	8 weeks and more No.
1	65	12.7	38	26*
2	40	8.9	19	21
3	17	4.5	7	10
4	19	6.6	12	7
5	8	3.6	4	4
6	7	4.4	2	5
7	9	8.6	3	6
8	4	7.1	1	3
9	1	3.0	0	1
10	2	1.2	1	1
11	0	0.0	0	0
12	0	—	0	0
Total	172	—	87	84
Per cent	100		50.6	48.8

\*One woman did not report the duration.

second and the third were 2.8 years and there was a slight tendency for the spacing to reduce in later parities though it was not quite significant. The mean interval between pregnancies by the present age of mothers is shown in Table XV. It is evident from the table that the mean age between pregnancies for the younger women of 14-23 years was different from the spacing in respect of women above 34 years; the spacing between pregnancies of women between 24 and 33 years was slightly less than that of the later age-group. The mean interval between consummation to pregnancy for different age-groups was more markedly different. The younger women had a markedly lesser interval than the older women. Roy<sup>10</sup> reported in his study of Hooghly district an average interval between births for rural sample to be 32 months and for urban sample 38 months. These differences might be due to either or both of the following reasons:

(i) Possibly, the older women had forgotten or missed to report pregnancies which had resulted in foetal losses or death of infants, and (ii) the social and cultural restrictions imposed on married



TABLE XV: Mean interval (in years) between pregnancies by current age of mother

Current age-group (years)	No.	Consummation & 1	Parities						
			1 and 2	2 and 3	3 and 4	4 and 5	5 and 6	6 and 7	7 and above
14-23	233	2.3	2.5	2.0	2.0	1.7	2.2	1.3	0.0
24-33	258	3.0	2.8	2.7	2.5	2.2	2.1	2.3	2.0
Above 34	93	3.7	3.5	2.8	3.1	3.1	2.7	2.5	2.6
For all women	584	2.8	2.8	2.8	2.6	2.5	2.4	2.2	2.4

couples by the joint family system of living possibly resulted in longer intervals between pregnancies.

Table XVI gives the per cent pregnancies according to mean intervals. It is seen that in any parity, about two-thirds to three-fourths of the pregnancies occurring in this population had a mean spacing of two to three years. Only 10 to 16 per cent of the pregnancies had occurred with a year or less spacing. Perhaps the above observation of normal spacing of 2-3 years could be interpreted as due to lactation amenorrhea.

TABLE XVI: Per cent pregnancies according to mean intervals and parity order

Mean interval	Parities				
	1 and 2	2 and 3	3 and 4	4 and 5	All
1 year and less	15.9	11.7	10.1	11.1	12.7
2-3 years	63.3	74.1	77.9	76.9	71.6
3+ years	20.8	14.2	12.0	12.0	15.7

*Note:* Interval between pregnancies for 557 pregnancies were not known.

Table XVII indicates the mean interval between pregnancies and the outcome of subsequent pregnancies. When the mean interval was a year or less, it resulted in higher pregnancy wastage. However, we did not find any difference when the mean interval was 2-3 years or 3+ years.

TABLE XVII: Mean interval between pregnancies and outcome of subsequent pregnancies

Mean interval	Outcome of pregnancy	2 %	3 %	4 %	5 %	All %
1 year and less	Pregnancy wastage	11.5	21.7	13.0	12.0	14.4
	Live-births	88.5	78.3	87.0	88.0	85.6
	Total	100.0	100.0	100.0	100.0	100.0
2-3 years	Pregnancy wastage	4.5	2.4	3.6	2.9	3.3
	Live-births	95.5	97.6	96.4	97.1	86.7
	Total	100.0	100.0	100.0	100.0	100.0
3+ years	Pregnancy wastage	0.9	3.5	2.7	3.6	1.6
	Live-births	99.1	96.5	97.3	96.4	98.4
	Total	100.0	100.0	100.0	100.0	100.0

Note: Parity order 4 and above are excluded.

### Cohort Analysis

*Spacing between pregnancies according to sex and mortality and survival of the previous child:* It has been observed by several researchers that if a child dies shortly after his birth or if the pregnancy ends up with abortion or miscarriage, a new pregnancy would begin within a short interval. Under Indian social situations, a male progeny is valued highly both as a measure of family's continuity and as an old age security for parents. It is, therefore, expected that the sex of the previous child would have some relation to the birth interval of the subsequent pregnancy. It would also mean that if the previous child is a female, a shorter interval would result between the former and the subsequent pregnancy and vice versa.

Mean interval between pregnancies by the mortality and/or survival of previous child is indicated in Table XVIII. There was a definite trend for shorter intervals between each consecutive pregnancy when the previous child was dead than when he was alive. Khan<sup>11</sup> observed similar results in his study that if the child died, often a new pregnancy began within a short span; he also concluded that the infant mortality was a determinant factor in spacing. We may tentatively conclude that if the survival of the child is assured, a longer interval between births as well as reduction in births could be achieved.



TABLE XVIII: Mean interval between pregnancies (in years) by the mortality survival of previous child and by parity order

Condition	Mean interval in years between pregnancies					
	1 and 2	2 and 3	3 and 4	4 and 5	5 and 6	6 and above
Alive	3.2	2.8	2.9	2.7	2.6	2.5
Dead	2.5	2.3	2.4	2.5	2.0	2.0

Mean interval between pregnancies by sex and life span of the previous child was computed and shown in Table XIX, as both the factors are considered to be important in determining increase in fertility. But as revealed in the table, we do not find any difference in the mean intervals between pregnancies irrespective of the child's sex. We may therefore infer that in this sample, sex is not a determinant factor in spacing of births. Khan has found that for all orders of birth, when the previous child was male and dead, the interval was less than when the previous child was male and alive. He has also observed that

TABLE XIX: Mean interval between pregnancies in years by sex and life-span of the previous child and by parity order

Condition	Sex of previous child	Mean interval between pregnancies (years)					
		1 and 2	2 and 3	3 and 4	4 and 5	5 and 6	6 and above
Alive	Male	3.1	2.8	2.8	2.7	2.5	2.5
	Female	3.0	2.7	2.7	2.5	2.6	2.5
Died	Male	2.6	2.3	2.6	2.7	2.0	2.0
	Female	2.4	2.3	2.1	2.4	2.2	2.0
Died within a year	Both sexes	2.3	2.2	2.3	2.3	1.7	1.8
Died during second year	Both sexes	2.8	2.5	2.6	2.9	2.0	2.3
3+ years	Both sexes	3.4	2.7	3.0	3.0	2.5	3.0

for every order of birth, the interval between consecutive live-births when the previous issue was male and alive was greater than when the previous child was female and alive. The consistency of difference which he found in almost all orders of birth, was attributed by him to a preference of male births over females.

In Table XIX the mean intervals between pregnancies by sex and life-span of the previous child are indicated. We find again that in both sexes when the previous child was dead, the interval was more or less consistently shorter than when the previous child was alive. However, the life-span of the previous child appeared to influence the spacing between pregnancies. In particular, when the child had died within a year, the subsequent pregnancy occurred earlier than when the child survived for longer period. It will be seen from the table that the interval ranges from 2.5 to 3.4 years in the case of child mortality after 3 years, while the interval ranges from 1.7 to 2.3 years when the child died before one year.

### Summary

The retrospective history of 586 pregnant women between the reproductive age span of 14-18 years were studied in Mahbubnagar district of Andhra Pradesh and are discussed. The total number of pregnancies reported by these women were 2389, yielding a mean pregnancy rate of 4.1. However, about 70 per cent of the women were below the age of 30 years and hence had yet a large fertile period to complete. Considering the total effectively married years, only 13 per cent of the women had completed more than 20 years of married years and it appears that roughly one pregnancy had occurred to each woman for every five-year period of married years. Out of the total pregnancies reported by 586 women in the survey, 95.2 per cent resulted in live-births. Pregnancy wastage accounted for 4.8 per cent of the pregnancies.

*Age at Marriage:* The mean age at marriage of these women was 10.8 years. Upper caste women had a slightly higher mean age at marriage than the women of scheduled or backward castes, the latter having the lowest mean age. The perusal of mean ages at marriage for different age cohorts of women indicated a gradual increase in female age at marriage over the last three to four decades in the area.

*Sex Ratio:* The sex ratio at birth was in favour of female babies, which accounted for 998.2 male babies per 1000 female babies.



However, the sex ratio at the time of the Survey had reversed in favour of males, the ratio being 987.6 per 1000 males indicating thus a higher female mortality.

*Outcome of Pregnancy:* The analysis of outcome of pregnancy by current age of mother pointed out a larger wastage in pregnancy when the mothers were younger particularly when they were below 16 years. Outcome of pregnancies and pregnancy wastage rates (per 1000 pregnancies) over two decades did not follow any definite pattern. However, the pregnancy wastage during 1953-57 was larger and live-births less than during 1958-72. No changes appeared to have been effected during the period 1958-72 in pregnancy wastage or prematurity or live-birth rates.

*Vital Rates:* Neonatal, post-natal, infant and child mortality rates were computed for each year from 1952 to 1971 and weighted rates of mortality were computed for every five-year periods for 1952-71. There had been a progressive fall in the infant and child mortality rates from 1952 to 1971. Mean number of children died for 586 women was 0.9.

*Spacing between Pregnancies:* The mean age at first pregnancy was 16.7 years and about 59 per cent of the women had their first pregnancy between the age of 15 and 17 years. The mean interval between consummation and first pregnancy for different age-groups was markedly different. The younger women had a markedly lesser interval between pregnancies.

*Cohort Analysis:* Mean interval between pregnancies by the mortality and/or survival and by sex and life-span of the previous child was computed. There was a definite trend towards shorter intervals between each consecutive pregnancy when the previous child was dead than when it was alive. Sex was not found to be determinant factor in spacing of births. The life-span of the previous child appeared to influence the spacing between pregnancies. When the child had died within a year, the subsequent pregnancy occurred earlier than when the child survived for a longer period.

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## HEALTH AND NUTRITIONAL INTERVENTION

K.R. Ambuja Devi

Sustained Negative Balance of Calories or Nutrients — Methods Used: Clinical Assessment; Procedure; Bias of the Observer; Technique of Examination; Nutritional Anthropometry; Instruments used; Technique of Measurements — Mode of Presentation of Data: Clinical Signs; Weight Measurements — Results of Clinical Assessment: Protein-Calorie Malnutrition; Vitamin A Deficiency; Vitamin B Deficiency; Iron Deficiency — Reduction in Absolute Morbidity — Prevalence of Deficiencies in Women — Iron Deficiency Figures as a Major Nutritional Morbidity — Increasing Severity of PCM Level — The Programme Impact — Why this Continuing Absolute Morbidity?: Supplementary Food Inadequate; Not reaching the Beneficiary — The Clinical Pattern among Children — Growth Pattern among Children: The Toddlers — The Four Growth Charts: The Infants — Declining Growth Pattern — Modest but Visible Improvement.

### *Abstract*

Both health and nutritional intervention were instituted in the project as a single part of the experimental manipulation. The MCC Health and Nutritional Care was an input in both MCC and MCC+FLIT treatments. For purposes of analysis for this part of the report, the four experimental treatments of MCC, MCC+FLIT, FLIT and CONT are divided into two categories of 'Service' and 'Non-service'. The MCC and MCC+FLIT treatments fall in the 'service group' while FLIT and CONT treatment fall in the 'non-service group'. This chapter examines the findings of Phase II of the programme.

THE FINDINGS OF Problem surveys conducted earlier had brought out clearly that 'Nanju' (protein-calorie malnutrition), diarrhoea and respiratory infections; in that order, were identified by local women as the major causes of morbidity and mortality among infants and toddlers. An important objective of the project was, therefore, to initiate a programme for the reduction of mortality and morbidity among the young children by provision of health and nutritional services. The nutritional requirements of the target groups were sought

to be assessed through a food habit survey and a dietary survey. The surveys were to provide information on the type, magnitude, and severity of malnutrition so as to plan a suitable eradication programme. They were also to act as a test procedure to evaluate the on-going programme.

### **Sustained Negative Balance of Calories or Nutrients**

Under-nourishment and/or malnourishment is a morbid condition indicating a deviation from health. Such a condition is a result of sustained negative balance of either calories or other nutrients or both. It is an outcome of either deficient intake or of indigestion or malabsorption, leading to a loss of vital nutrients from the diet. It can also be the result of excessive expenditure of calories due to metabolic disturbances. The causative factors may act singly or together. When all these are considered in their totality, it will be obvious that supplementary feeding by itself cannot possibly tackle the problem of malnutrition. Attention would also need to be given for nullifying the effects of infections resulting in metabolic disturbances.

### **Methods Used**

The method employed to document the impact of the health and nutritional intervention was by direct clinical assessment and measurement of weight and height as in cross-sectional surveys at two points in time with an interval of approximately one year. The survey included women in the child-bearing age-group and children between 0 and 48 months.

*Clinical Assessment:* Assessment based on symptoms of structural changes manifested as physical signs of nutritional deficiency had been chosen as a method as it is relatively inexpensive and does not need elaborate equipment.<sup>1</sup> Such a procedure (as in most measurements) has its own inherent problems. The problem of errors in measurement and observer's bias were reduced as explained below.

*Procedure:* The selection of physical signs to be recorded in the survey were drawn from the 'classified list of signs used in Nutrition Surveys' as suggested by the WHO Expert Committee on Medical Assessment of Nutritional Status.<sup>2</sup> The list of signs was limited to the major signs prevalent in the community and 34 signs were made use of.



The definition of physical signs were based on the descriptive details of the WHO Committee's report. The schedule used in the Bench Mark Survey had grade the positive signs as mild, moderate and severe. But the schedule used in the Resurvey excluded grading. Also, the number of the signs was reduced to the essential signs numbering 13 which for the purpose of this report were grouped under 4 categories of nutritional deficiency. (See Table I for the individual signs used and their classification in Appendix 14.)

*Bias of the Observer:* All the observations were done by a single medical officer both the times in respect of all respondents. So errors from multiple examiners did not arise. As stated earlier the grading of signs as mild, moderate or severe were excluded and signs were recorded simply as positive or negative, eliminating to a certain extent the examiner's reliability to estimate grades.

*Technique of Examination:* All the examinations were carried out in the morning, under natural light in the respondents' houses. The duration of examinations per day was approximately 4 hours with 20 to 30 observations. Children were examined as far as possible in an open area and pregnant women were examined in privacy. The recording of the schedule was done along with the examination. The schedule was checked for completeness before leaving the respondent's house.

*Nutritional Anthropometry:* Body measurements provide another indicator of nutritional level of an individual and have been used to indicate nutritional profile to guide the programme. These measurements involve multiple and complex procedures and require sophisticated mathematical knowledge to report the results. The project restricted itself to only the relatively simplest measures of weight and height. This procedure was adopted in view of the limitations of the investigators' skill, the range of available equipment and the basic requirements of a field experiment.

*Instruments used:* For the purpose of weighing infants the UNICEF Beam balance was used for measuring up to 16 kilograms, with increments of 100 grams. A spring balance with a platform was used for older children. The linear measurements were taken with the aid of measuring tape of inexpandible fibre glass or metal.

*Technique of Measurements:* Recognising that the apparent simplicity of the measurement is deceptive, efforts were made to reduce inaccuracy by training the staff under field conditions and through periodic checking. However, no formal quantitative methods

of checking the reliability and validity of measurements have been employed in this programme. The procedure was mainly intended to gain general information on the type of malnutrition for developing the health programme.

Infants of 0-11 months were weighed in the nude on the UNICEF Beam balance. The toddlers who were cooperative were weighed on the spring balance while those who were apprehensive or difficult were weighed along with the mother on the spring balance. All adult women were weighed in their usual dress and jewels. The jewels commonly used were weighed and their weight subtracted from the original records. For linear measurements two types of measuring techniques were used. Children of 0-11 months and those who were not able to stand erect were measured in a recumbent posture taking crown to heel length, and the children who could stand and the women were measured while standing.

### Mode of Presentation of Data

The sample size reported in this section consisted of those women and children who were available for interview at both Bench Mark and Resurveys. Results of women and children are analysed separately. The children, for the report on the growth pattern, are considered in two categories as infants (0-11 months) and toddlers (12-36 months) taking the age at the Bench Mark Survey for classification.

*Clinical Signs:* The clinical signs observed are reported as 'percentage of positive' for each of the signs. The positive signs are listed together in accordance with signs suggestive of various deficiencies.<sup>3</sup> The percentage of the total population in a group is classified in the group total. The deficiencies considered are protein-calorie malnutrition (PCM) as indexed by oedema, muscle wasting and moon face; vitamin B complex deficiencies in the form of angular stomatitis, calf muscle tenderness, tongue fissures and smooth tongue; and lastly, iron deficiencies evidenced as pallor, koilonychia and low haemoglobin content.

In order to reflect patterns of individual morbidity, single and overlapping *group* deficiencies are presented as prevalent percentages at Bench Mark and Resurvey along with change levels.

*Weight Measurements:* The weight measurements are expressed in terms of the general standard of reference (Harvard).<sup>4</sup> This established method is used in place of local standards due to the following



reasons:

(1) Many of the 'standards' in tropical countries, such as India, are based on inadequate and improper samples of children in low socio-economic groups of rural population exposed to infection and parasitic infestation or groups of urban population. In the context of our study, this could not be utilised since the picture of morbidity may be lopsided.

(2) Further, monthwise 'standards' during the age of 0-47 months are not available.

The physical growth is based on the ratio of weight for age, expressed as a percentage of the Harvard standard.

For the purpose of this report, the children were categorised into three broad categories as:

1. children above 81 per cent of expected weight;
2. children between 80 and 61 per cent of expected weight; and
3. children below 60 per cent of expected weight.

### **Results of Clinical Assessment**

The presence of positive physical signs of nutritional deficiency observed by clinical assessment of Bench Mark and Resurvey by 'non-service' and 'service' experimental categories among categories of children of Phase II is presented in Table I and those of women in Table II (see Appendix 14).

Table II shows that among the children in the non-service group the children showing any sign of malnutrition or total nutritional deficiency had increased from 41.1 per cent at Bench Mark to 72.6 per cent at Resurvey increasing the absolute morbidity by 31.5 per cent ( $72.6 - 41.1 = 31.5$ ). In the case of the service group during Resurvey, the nutritional deficiency registered a decrease from 71.1 to 28.9 per cent reducing the absolute morbidity by 42.2 per cent. This indicates that the programme of Health and Nutritional Care provided as part of the experimental manipulation had made an impact in reducing the prevalence of morbidity among the children.

*Protein-Calorie Malnutrition:* The relative degree of severity of deficiency of each group and the change in prevalence of each deficiency at two points in time reflect the magnitude of the problem. Protein-calorie malnutrition in the non-service group indicates a



higher prevalence from 28.8 per cent at Bench Mark to that of 68.8 per cent during Resurvey. This shows a deterioration in the nutritional status of the children. On the contrary, the service children recorded a reduction from 45.6 per cent to 21.5 per cent from Bench Mark to Resurvey. This feature is an indication of significant improvement among the children of service group in the reduction of incidence of PCM.

Individual deficiency sign of oedema showed a decrease from 8.2 per cent to 5.5 per cent while muscle wasting and moon face have shown an increase by 18 and 34 per cent respectively in non-service group. The reduction in oedema is an indication that the terminal stages of the deficiency had been reduced. The service group recorded a low incidence of oedema of 2.0 per cent at Bench Mark which remained constant while a decrease from 14.8 to 10.1 per cent in muscle wasting and 39.6 to 6.1 per cent in moon face was registered. This finding in reduction in association with PCM prevalence shows a stage of positive recovery to normal health among the service children when compared with non-service children.

*Vitamin A Deficiency:* The prevalence of vitamin A deficiency showed an increase by 5 per cent from the time of the Bench Mark in the non-service group while in the service group it had decreased by 25.4 per cent from the Bench Mark level. This shows that the intervention of providing vitamin A concentrate as a single dose to the service children had made a significant reduction. Keratomalacia was absent in both categories at Resurvey time. The other signs in trend with increase of total prevalence also showed an increase in non-service group and an overall decrease in service children at Resurvey.

*Vitamin B Deficiency:* Vitamin B deficiency decreased in both non-service and service children from 16.4 to 13.7 per cent and 4.0 to 1.3 per cent respectively. Calf muscle tenderness was absent in both the categories at both times of survey. The angular stomatitis remained constant in the non-service group while there was a decrease from 3.4 to 1.3 per cent in service children. Tongue fissures observed earlier in non-service children were absent at Resurvey and smooth tongue showed a slight decrease from 5.5 per cent to 4.1 per cent while it was absent at Resurvey time in service children. The presence of angular stomatitis in both categories is indicative of Ariboflavinosis. However, the deficiency of this group needs further observation.

*Iron Deficiency:* Iron deficiency showed an increase in both groups from 28.8 to 72.6 per cent in non-service and from 17.4 to 25.5 per



cent in service children indicating that further steps have to be taken to investigate the condition and institute better corrective measures. The service group compares fairly well with the non-service group because of the absence of koilynychia at both points of survey.

Among the non-service children the order of deficiency at Bench Mark was: iron and PCM at equal rate of prevalence, followed by vitamin A and vitamin B. At Resurvey, the order of prevalence was: iron deficiency, PCM, vitamin B and vitamin A. This reversal of order among vitamin A and B cannot be interpreted.

In the service group the Bench Mark showed PCM, vitamin A, iron and vitamin B deficiencies in that order of magnitude while at Resurvey the order of magnitude changed to iron, PCM, vitamin A and vitamin B deficiencies. Iron deficiency showed an increased prevalence at Resurvey time while all other deficiencies recorded a decrease.

### **Reduction in Absolute Morbidity**

The data brought out the fact that the type of malnutrition widely prevalent in the community was one of iron and PCM. Even with active intervention, the programme could not completely eliminate any one of the deficiencies.

The overall finding at the end of a year's programme for service children is that there has been a reduction in absolute morbidity. In terms of morbidity of 28.9 per cent among service children, all the deficiencies with the exception of iron had shown a decrease in prevalence, indicating that even in the short duration of the programme, vitamin deficiency and protein-calorie malnutrition could be reduced.

### **Prevalence of Deficiencies in Women**

Table II shows the prevalence of deficiencies as observed in women (see Appendix 14).

Ninety per cent of non-service women had at least one sign of nutritional deficiency at the time of Resurvey, showing an increase over the Bench Mark level thirteen months earlier by 23.3 per cent. The service group recorded a decrease of 63.0 per cent (93.9 to 30.9 per cent) in respect of total nutritional deficiency at the time of Resurvey.

The percentage of non-service women in the positive PCM category had increased from 10.0 to 24.4 per cent at Resurvey while the number of service women decreased from 20.5 to 17.2 per cent. This indicated that while there was an upward trend in morbidity in the non-service group, the service group had fared marginally better for the PCM syndrome. Oedema, absent in the Bench Mark, showed up with 3.3 per cent at Resurvey time among the non-serviced. The disappearance of oedema in the service group from a meagre prevalence at Bench Mark (0.6 per cent) is indicative of a decrease in the level of severity. The 'muscle wasting' result of chronic PCM had shown an increase in the non-service group from 8.9 to 17.8 per cent showing a tendency of deterioration in PCM morbidity. The service group, recording a decrease of 2.8 per cent only for muscle wasting, indicates that the programme had very little effect in eliminating this condition.

Vitamin A deficiency in non-service women had increased in its prevalence by 3.8 per cent. With the exception of ocular change of Keratomalacia, which decreased by 1.1 per cent, the increase in other signs showed a deteriorating trend. The service group on the contrary showed a significant decrease by 25.9 per cent. All the individual signs also showed a reduction. This shows that the programme was adequate to deal with vitamin A deficiency.

The vitamin B groups of deficiency in non-service women showed a marginal increase from 53.2 to 56.7 per cent. The individual signs of angular stomatitis and calf muscle tenderness increased while tongue fissures and smooth tongue decreased from their Bench Mark level, showing that Riboflavin and Thiamine deficiency was more than Niacin deficiency. In the service group the prevalence rate of vitamin B deficiency recorded a decrease from 59.8 to 32.6 per cent accompanied by a decrease in all the signs except tongue fissures. The decrease level for angular stomatitis (9.4 per cent) and calf muscle tenderness (9.6 per cent) was more than that for smooth tongue (3.9 per cent). The programme seems to have made an impact on reduction in prevalence rate rather than in changes in the clinical pattern of vitamin B deficiency.

### **Iron Deficiency Figures as a Major Nutritional Morbidity**

Iron deficiency which was high at the time of Bench Mark, recording 73.3 per cent, had shown an increase to 87.8 per cent among the non-



service group. The evidence of high prevalence of iron deficiency with a tendency towards increased incidence in a year shows that it is a major nutritional morbidity to be reckoned with among women. Among the individual signs, a decrease was observed in nail change widened by Koilonychia while the other items showed an increase.

The service women showed a decrease of total iron deficiency from 86.1 per cent. The decrease is indicative of a positive trend towards reduction of morbidity as a result of iron deficiency. However, a prevalence rate of 54.1 per cent does not allow room for complacency. The iron deficiency specifically treated during the programme had definitely not made much improvement. This might have been due to the fact that contributory causes such as parasitic infestation could not be adequately tackled as most of the women were exposed to it due to walking bare-foot in the fields, where night soil disposal takes place. Among the individual signs, all the items showed a decrease which runs parallel to the reduction in total incidence.

### **Increasing Severity of PCM Level**

The final result of programme intervention in the service group of women shows that there was an increase of 'oedema' in Group I of non-service women and fresh evidence of it in women at Bench Mark. Indeed, the complex of protein-calorie malnutrition was passing on to a more severe level than in the previous year!

Total morbidity decreased in both children and women of the service group from 71.1 to 28.9 per cent and 93.9 to 30.9 per cent respectively. This took place after a period of approximately one year of direct health and nutritional care. The per cent reduction was approximately similar in both the cases.

Incidence of individual deficiencies in children of the service group showed a significant decrease in PCM from 45.6 to 21.5 per cent and vitamin A from 22.1 to 6.7 per cent with a low incidence of vitamin B deficiency and an increase in iron deficiency. The women showed a significant decrease of deficiency of vitamin B, vitamin A and iron with marginal decrease in PCM, compared to the Bench Mark level. The prevalence of 54.1 per cent iron deficiency in respect of women and an increase in its incidence among children by 8.1 per cent from the base of the Bench Mark indicates that even with active intervention, the problem required other supportive measures to eliminate the condition. This shows that for both children and mothers



there was a reduction of the total level of morbidity whereas the non-service groups recorded an increase. The morbidity level of women in the service category showed a significant reduction in incidence of vitamin A deficiency with marginal improvement in PCM, vitamin B deficiency and iron deficiency while women in the non-service category showed an increase in all deficiencies indicating a deterioration even within the morbidity.

### **The Programme Impact**

The programme impact as shown by direct clinical assessment analysed from physical signs among women and children is as follows:

- Total morbidity increased in both children and women in the non-service group from 41.1 to 72.6 per cent and 76.7 to 90.0 per cent respectively after an interval of one year. (The morbidity level showed a higher increase among children.)
- The incidence of individual deficiencies recorded an increase of iron and PCM with a decrease in vitamin A and B among children in the non-service group. Individual signs of deficiency increased among women of the non-service group with the highest percentage in iron deficiency.
- The individual signs indicating the grades of deficiency within the group in service children showed that the oedema in PCM was stationary while it was absent in women. All the other signs showed a uniform pattern in reduction from the Bench Mark level in both the target groups of women and children. (The programme seems to have made some headway in reducing the severity of nutrition-related disorders in both women and children.)

How did the clinical pattern in an individual react to the programme? For studying this, the clinical signs were analysed. In order to observe the change level of morbidity, each individual was classified under one of the following categories:

1. no deficiency – when there was total absence of any positive physical sign of nutritional deficiency;
2. single deficiency – when there was a positive sign in only one group; and
3. multiple deficiency – when there were positive signs in more than



one group.

Category 2 was further classified into:

- (a) iron deficiency – when any sign in this group was positive,
- (b) vitamin deficiency – when any sign in vitamin A, or vitamin B was positive, and
- (c) PCM – when any of the signs in PCM was positive.

The 'change' is a score obtained for each item by subtraction of Bench Mark score from Resurvey score. Positive change in the item of 'no deficiency' indicates improvement while positive changes for items 2 and 3 indicate deterioration. The two criteria considered for interpretation of Table III (see Appendix 14) are apparently normal as indicated by 'no deficiency' to indicate the proportion of morbidity in the children and the relative proportion of single and multiple deficiency to indicate the grade or severity of morbidity.

### **Why this Continuing Absolute Morbidity?**

Table III (Appendix 14) shows that there has been a decrease in the number of non-service children in the 'no deficiency' category from 16.4 to 6.5 per cent. This indicates that there has been an increase by 9.9 per cent of absolute morbidity since the Bench Mark, thus marking a deterioration of nutritional status among the children. In the case of service children the decrease is 11.3 per cent. This shows that the absolute morbidity ran its natural course of increase in spite of the programme intervention for a period of one year. This raises the question as to what was the cause for this condition. The probable cause could have been due to the following factors:

1. *Supplementary Food Inadequate:* As the beneficiaries hail from low socio-economic groups, the supplementary food was intended to replace a part of the child's diet. But in reality, it formed only an inadequate addition to the requirements of the child. What is more, the traditional practice was to share 'everything in the pot' with everyone in the family. This cultural factor, which could not be violated, led to an inadequate quantum of supplementary food reaching the child.

2. *Not Reaching the Beneficiary:* The supplementary food of the child was only given to the mother when she attended the class regularly. She was also instructed to use the daily ration exclusively for the child. But the check-up at home as a follow-up procedure

revealed that mothers with infant beneficiaries of 6-11 months collected the ration but actually used it for the older siblings.

3. The programme staff could not resort to 'on-the-spot-feeding', due to local customs. The only check was at the point of food distribution.

### **The Clinical Pattern among Children**

The single deficiency category of non-service children shows a decrease in prevalence of PCM by 22.9 per cent and iron deficiency by 1.6 per cent. When considered by itself one would surmise that the morbidity level has been reduced. Such a conclusion is certainly not warranted as evidenced by increase of 'multiple deficiency' recording 34.4 per cent, compared to Bench Mark level. The relative morbidity increased not only in quantitative terms but qualitatively with severity of morbidity showing a significant morbidity change of deterioration.

The service group of children on the other hand showed an increase of PCM by 32.6 per cent and absence of vitamin and iron deficiencies along with decrease of multiple deficiency by 18.6 per cent from the time of Bench Mark. This indicates that while in terms of absolute morbidity, the health intervention did not have the expected result, the quality of morbidity changed from severe to a lesser degree of severity.

Compared to this, among the service women, iron and vitamin deficiency had increased by 5.0 per cent and 7.2 per cent respectively. While all the three items under multiple deficiency recorded a decrease of 12.7 per cent, 5.5 per cent and 20.0 per cent respectively, the change of pattern clearly brings out the transition from severe cases to less severe ones and an improvement in individual morbidity. The programme resulted in a qualitative change towards better nutritional status.

Considering the change of morbidity of individual women and children, the children exhibited more than two major deficiencies while most of the women showed only deficiency of vitamins/PCM. This indicates that the impact of the programme had resulted in a positive change in reducing absolute morbidity among women. It had also brought about a qualitative change for better levels of health among both women and children with its direct intervention of health and nutritional care.



### **Growth Pattern Among Children**

The growth trend among children and their deviations from a standard frame of reference had been used by many researchers as an indicator of nutritional status. Various physical measurements of the body, singly or in combination, have been used to classify the grades of severity of malnutrition, especially of protein-calorie malnutrition. Every child at each age was assigned a percentage level of its body weight for age in relation to an expected Harvard standard weight for age. The data were further classified into levels of nutritional status under the following categories:

- i. Apparently normal – 81 per cent and above of expected body weight for age.
- ii. Mild and moderate underweight – 80 to 61 per cent of expected body weight for age.
- iii. Severe underweight – 60 per cent and below.

Results for the observations are shown at the Bench Mark and Resurvey in Figure I (see Appendix 14). Columns 1 and 2 indicate non-service children and columns 3 and 4 indicate service children at Bench Mark (BM) and Resurvey (RS) respectively. Comparing column 2 with column 1 it will be seen that there is increase in severe level, increase in mild and moderate underweight with decrease in the apparently normal. The figure shows that the proportion of children in the severe grade of morbidity had increased in non-service children. Comparison of column 4 with column 3 indicates that the proportion of service children at the severe level decreased, mild and moderate level increased and apparently normal decreased. The overall position in the service group is that the morbidity level increased as a whole but the severe grade of morbidity was less compared with that of non-service children.

*The Toddlers:* Columns 5, 6 and 7, 8 refer to the toddlers at Bench Mark and Resurvey of non-service and service children. Column 6 compared with column 5 shows that there was an increase of mild and moderate underweight with marginal decrease in the severe level and the apparently normal. Column 8 compared with column 7 shows an increase in mild and moderate level and a decrease in the severe level with the apparently normal remaining at a stationary level. The picture emerging as the patterns of change shows only marginal net improvements among the infants and toddlers of service children,



when using this categorical system of analysis.

The actual differences in percentage weight/age for each child over the experimental period was analysed, comparing service with non-service children. The differential scores of the percentage level were grouped for infants of non-service and service as well as for toddlers in the respective categories. The results are shown in Table V (see Appendix 14). From Table VI it will be seen that the mean weight for age per cent loss was lower among service participants for both infants and toddlers and this difference was statistically significant at the 1 per cent level. This analysis clearly shows that the impact of the experimental treatment on the service children led to an improvement in their growth.

### **The Four Growth Charts**

A third method of depicting the results of the service programme was to chart the actual growth pattern of the children for service and non-service groups separately. Since the charts got a little crowded, infants and toddlers were separated and thus four growth charts are presented (see Appendix 14).

The non-service infant growth pattern shown in Figure II indicates that the majority of the infants of 0-5 months were above the 80 per cent level at the Bench Mark while none were below 60 per cent level. At the end of the service programme when the infants were between 13 and 18 months of age at the Resurvey, only one was above 80 per cent, most were in the 80-60 per cent and three had come down below the 60 per cent level. This growth pattern shows that even though the majority of children were above 80 per cent, with advancing age their growth lagged as compared to minimum standards. The majority of the infants between 6 and 11 months at Bench Mark were in the 80-60 per cent grade, with a few above 81 per cent and one below 60 per cent level. The growth lag was present at the Bench Mark period itself but was of mild or moderate degree. At Resurvey time, i.e., between 19 and 24 months of age, one who was among the 80 per cent and above remained at the same level and two others above the 80 per cent had fallen below the 60 per cent level, one among 80-60 per cent fell below 60 per cent level with the rest confined to 80-60 per cent. The tendency was to lie closer to lower edge of the panel. This also showed an increased growth lag with advancing age similar to 0-5 months age, cohort.



*The Infants:* The service group infant growth pattern is presented in Figure III. The 0-5 month-olds are seen mostly above 81 per cent with a few in 80-61 per cent and an isolated case below 61 per cent. This shows that infants at this period were sufficiently healthy. At the Resurvey those children who were 80 per cent and above had come down with the majority falling in 80-61 per cent. Those who were 80-61 per cent remained confined within the same panel but closer to the upper reaches of the panel while the one below 60 per cent remained in the same level. The picture of the growth pattern is similar to that of non-service infants; with advancing age the growth lag starts operating, but those in 80-61 per cent approximating to the upper limit of the range indicate that the deterioration was being lessened. Among the 6-11 month-olds there were two above 80 per cent and five below 60 per cent level and majority in 80-61 per cent level. At the Resurvey between the ages of 16 and 21 months the children above 80 per cent maintained the same grade; there were few who had risen from 80-61 per cent to above 80 per cent. Three out of four below 60 per cent improved and were found to be in the 80-61 per cent grade and those in 80-61 per cent remained in the same grade with later observations being closer to 80 per cent limits.

### **Declining Growth Pattern**

The non-service toddlers' growth pattern is shown in Figure IV. According to the figure, at Bench Mark out of 34 children of 12-36 months, 3 were in the grade 80 per cent and above, 16 were in 80-61 per cent grade and 15 were in below 60 per cent level, showing that the growth lag becomes established in this range with majority recording underweight, distributed equally among mild and moderate level and severe level. There is a larger proportion in 24-36 months than in 12-24 months. At the Resurvey there seems to be a further fall with the growth lines showing in general declining slopes when compared with even the 80 per cent or 60 per cent of standard slopes of growth.

The growth pattern of the service toddlers is shown in Figure V. Most of the toddlers at the Bench Mark started either below the 60 per cent standard or in the 80-61 per cent standard. The growth lines in general show an upward trend with 15-20 toddlers crossing the category lines. The slope of the lines in the vast majority of the cases is steeper than the 60 per cent or 80 per cent standards. This is

particularly true of the 30-40 month age-group. This figure demonstrates that the health and nutritional services can raise the slope of the growth pattern even steeper than the standard but only bring the children to about 70 per cent of the Harvard standard of weight for age.

### Modest But Visible Improvement

When we take the four figures together and compare the service infants and toddlers with the non-service infants and toddlers, *first*, we observe a modest but visible improvement of the service children. The service children show growth lines slightly steeper than the standard slopes after the age of 12-16 months. The growth lines of the non-service children show a lower slope than the standards. *Second*, the growth lines seem to suggest a different normative pattern of growth to the Harvard standards. Indian children seem to start above this standard at the 0-6 month cohort and declining as we reach the 30-40 month cohort. *Third*, the service intervention can at best raise the growth slope, so that it becomes similar to or steeper than the standard slope, but the weight for age norm can probably only be raised to about 70-80 per cent of the Harvard standard in the 12-40 month cohort.

### Notes and References

1. D.B. Jelliffe, *The Assessment of the Nutritional Status of the Community*, Geneva, 1966. Monograph Series No. 53.
2. *WHO Report of the Expert Committee on Medical Assessment of Nutritional Status*. Geneva, 1963. WHO Technical Report Series No. 258.
3. D.B. Jelliffe, *op. cit.*, p. 43.
4. *Ibid*, p. 221.



## APPENDIX 14

TABLE I: Grades of PCM classification – Indian Academy of Paediatrics

Grade of PCM	Percentage of expected weight	Description
1. Normal	81 or above	—
2. Grade I underweight	71-80	Mild PCM
3. Grade II underweight	61-71	Moderate PCM
4. Grade III underweight	51-60	Severe PCM
5. Grade IV underweight	50 or less	Very severe PCM

TABLE II: Percentage prevalence of physical signs of nutritional deficiencies during Bench Mark (BM) and Resurvey (RS) by experimental treatment categories – children (Phase II)

Physical signs of nutritional deficiency		Experimental categories	
		Non-service %	Service %
1		2	3
<i>I. Protein-calorie malnutrition:</i>			
(a) Oedema	BM	8.2	2.0
	RS	5.5	2.0
(b) Muscle wasting	BM	9.6	14.8
	RS	27.4	10.1
(c) Moon face	BM	23.3	39.6
	RS	57.5	16.1
Sub-total*	BM	28.8	45.6
	RS	68.5	21.5

(Contd.)

TABLE II (Contd.)

1		2	3
<i>II. Vitamin A deficiency:</i>			
(a) Xerosis	BM	12.3	22.2
	RS	12.3	6.7
(b) Keratomalacia	BM	8.2	6.0
	RS	0.0	0.0
(c) Bitot's Spot	BM	5.5	0.7
	RS	9.6	0.2
Sub-total	BM	17.8	22.1
	RS	12.8	6.7
<i>III. Vitamin B deficiency:</i>			
(a) Angular stomatitis	BM	11.0	3.4
	RS	11.0	1.3
(b) Calf muscle tenderness	BM	0.0	0.0
	RS	0.0	0.0
(c) Tongue fissures	BM	1.4	0.0
	RS	0.0	0.0
(d) Smooth tongue	BM	5.5	0.7
	RS	4.1	0.0
Sub-total	BM	16.4	4.0
	RS	13.7	1.3
<i>IV. Iron deficiency:</i>			
(a) Pallor	BM	28.8	25.5
	RS	61.6	17.5
(b) Koilonychia	BM	6.9	0.0
	RS	4.1	0.0
(c) Low haemoglobin content	BM	31.5	21.5
	RS	61.6	15.4
Sub-total	BM	28.8	17.4
	RS	72.6	25.5
<i>V. Total nutritional deficiency:</i>			
	BM	41.1	71.1
	RS	72.6	28.9

\*The prevalence is reported without information on low body weight.



TABLE III: Percentage prevalence of physical signs of nutritional deficiency during Bench Mark (BM) and Resurvey (RS) by experimental treatment categories – women (Phase II)

Physical signs of nutritional deficiency		Experimental categories	
		Non-service (N=90) %	Service (N=166) %
1		2	3
I. Protein-calorie malnutrition:			
(a) Oedema	BM	0.0	0.6
	RS	3.3	0.0
(b) Muscle wasting	BM	8.9	18.8
	RS	17.8	16.0
(c) Moon face	BM	1.1	1.7
	RS	7.8	1.7
Sub-total	BM	10.0	20.5
	RS	24.4	17.2
II. Vitamin A deficiency:			
(a) Xerosis	BM	15.6	32.6
	RS	22.2	8.3
(b) Keratomalacia	BM	3.3	9.4
	RS	2.2	0.6
(c) Bitot's spots	BM	3.3	3.9
	RS	8.9	2.2
Sub-total	BM	18.4	34.3
	RS	22.2	8.4
III. Vitamin B deficiency:			
(a) Angular stomatitis	BM	35.6	35.9
	RS	53.3	26.5
(b) Calf muscle tenderness	BM	30.0	38.1
	RS	52.2	26.5
(c) Tongue fissures	BM	12.2	2.8
	RS	8.9	4.4
(d) Smooth tongue	BM	18.9	13.3
	RS	16.7	9.4
Sub-total	BM	53.2	59.8
	RS	56.7	32.6

(Contd.)

TABLE III (Contd.)

1		2	3
IV. Iron deficiency:			
(a) Pallor	BM	73.3	85.1
	RS	87.8	54.1
(b) Koilonychia	BM	48.9	58.0
	RS	31.1	14.4
(c) Low HB content	BM	64.4	82.3
	RS	87.8	54.1
Sub-total	BM	73.3	86.1
	RS	87.8	54.1
V. Total nutritional deficiency:			
	BM	76.7	93.9
	RS	90.0	30.9

TABLE IV: Percentage prevalence of clinical pattern of nutritional deficiency at Bench Mark (BM), Resurvey (RS) and 'change' among children in experiment categories - Phase II

Clinical pattern of nutritional deficiency		Non-service %	Service %
I. No deficiency:			
	BM	16.4	20.6
	RS	6.5	9.3
	Change	-9.9	-11.3
II. Single deficiency:			
(a) Protein-calorie malnutrition*	BM	47.5	42.0
	RS	24.6	74.6
	Change	-22.9	+32.6
(b) Vitamin deficiency	BM	0.0	0.6
	RS	0.0	0.0
	Change	0.0	-0.6
(c) Iron deficiency	BM	1.6	0.6
	RS	0.0	0.0
	Change	-1.6	-0.6
III. Multiple deficiency:			
	BM	34.4	34.6
	RS	68.8	16.0
	Change	+34.4	-18.6
N		61	150

Note: 'Change' percentage was obtained by subtracting BM percentage from RS percentage. Positive in 'change' percentage for item I indicates improvement and for II and III indicates deterioration.

\*Prevalence includes signs and computed low body weight.



TABLE V: Percentage prevalence of clinical pattern of nutritional deficiency at Bench Mark (BM) and Resurvey (RS) with change levels among women in the experimental categories - Phase II

Clinical pattern of nutritional deficiency		Non-service %	Service %	
1	2	3	4	
I.	<i>No deficiency:</i>	BM	17.7	7.2
		RS	8.3	33.3
		Change	-9.4	+26.1
II.	<i>Single deficiency:</i>			
	(a) Iron deficiency	BM	22.9	19.4
		RS	13.5	24.4
		Change	-9.4	+5.0
	(b) Vitamin deficiency	BM	1.0	3.9
		RS	1.0	11.1
		Change	0.0	+7.2
	(c) Protein-calorie malnutrition	BM	0.0	0.0
		RS	0.0	0.0
		Change	0.0	0.0
III.	<i>Multiple deficiency:</i>			
	(a) Iron with vitamin deficiency	BM	35.4	27.7
		RS	43.7	15.0
		Change	+8.3	-12.7
	(b) Iron with PCM	BM	3.1	10.5
		RS	1.0	5.0
		Change	-2.1	-5.5
	(c) Iron with vitamin and PCM	BM	19.8	31.1
		RS	32.3	11.1
		Change	+12.5	-20.0
	N		96	180

Note: 'Change' percentage was obtained by subtracting BM percentage from RS percentage. Positive change percentage in item I indicates improvement. In items II and III it indicates deterioration.

TABLE VI: Mean of the body weight for age percentages of the non-service and service children

Type (Age at BM)		Non- service	Service	t-value
A. Infants (0-11 months)	$\bar{X}$	-16.95	-4.84	2.72*
	SD	11.66	18.03	
	N	19	60	
B. Toddlers (12+ months)	$\bar{X}$	-0.59	5.99	3.30*
	SD	12.57	7.87	
	N	34	76	

\*Significant at 1% level.



Fig. 1 THREE LEVELS OF NUTRITIONAL STATUS (PHASE II)

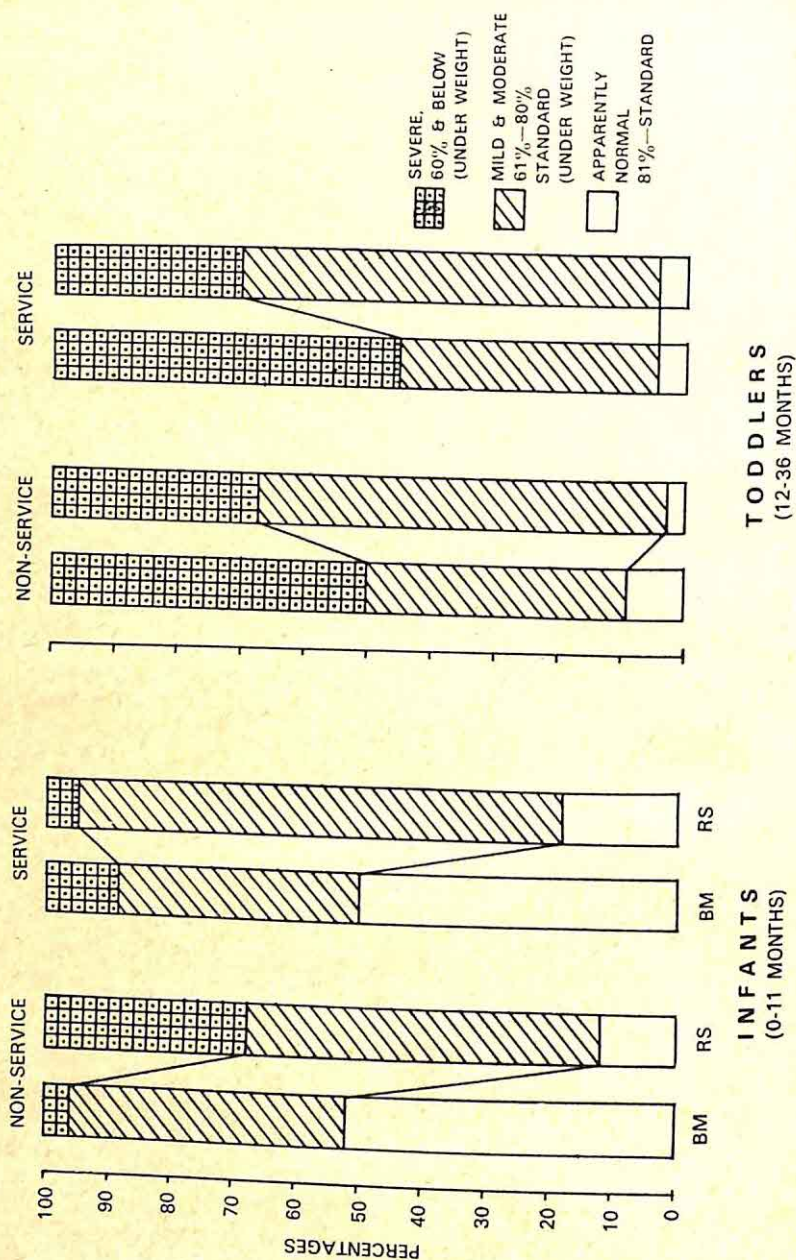


Fig. II GROWTH PATTERN : (NON-SERVICE) INFANTS  
(0-11 MONTHS)

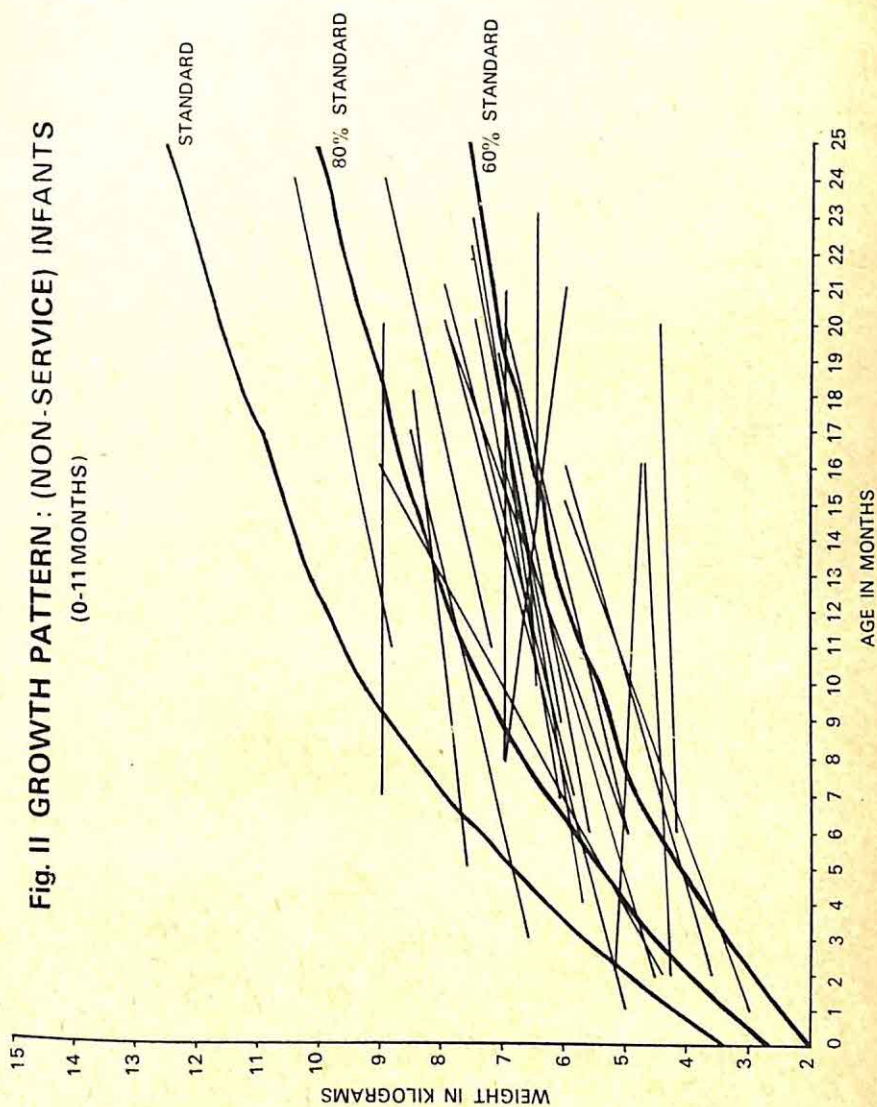
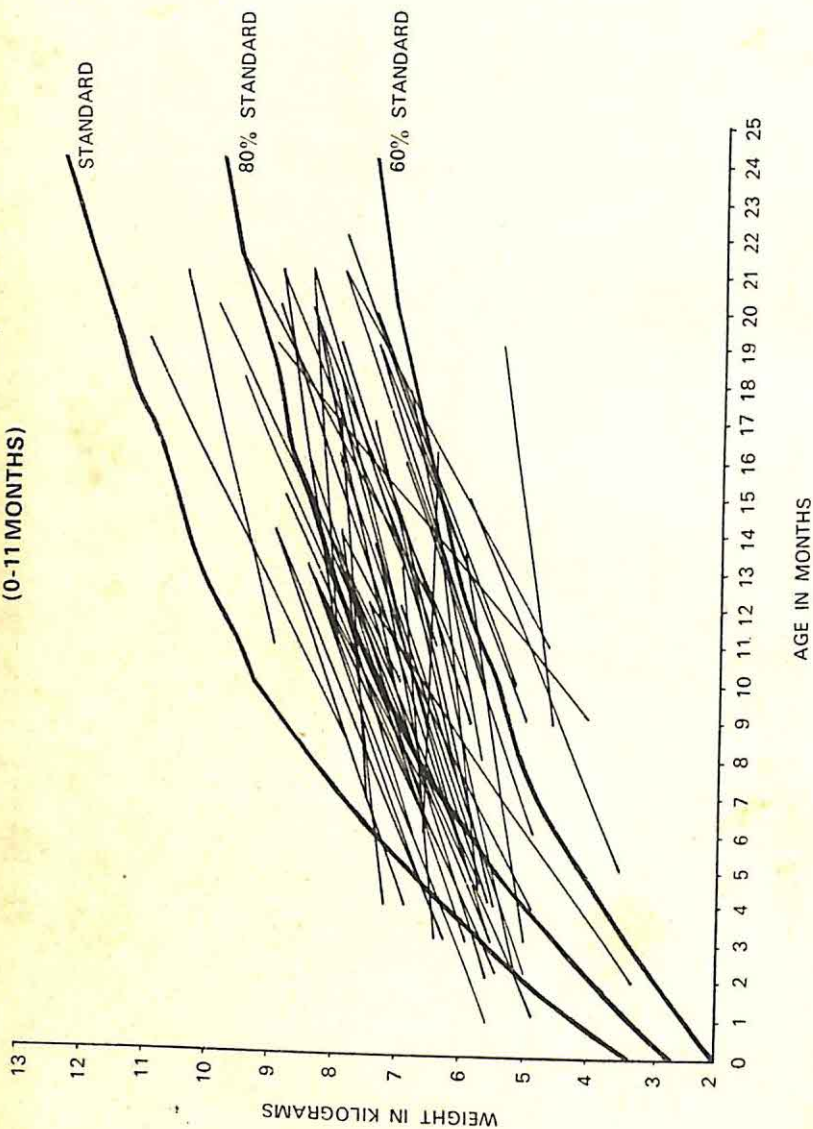




Fig. III GROWTH PATTERN : (SERVICE) INFANTS  
(0-11 MONTHS)



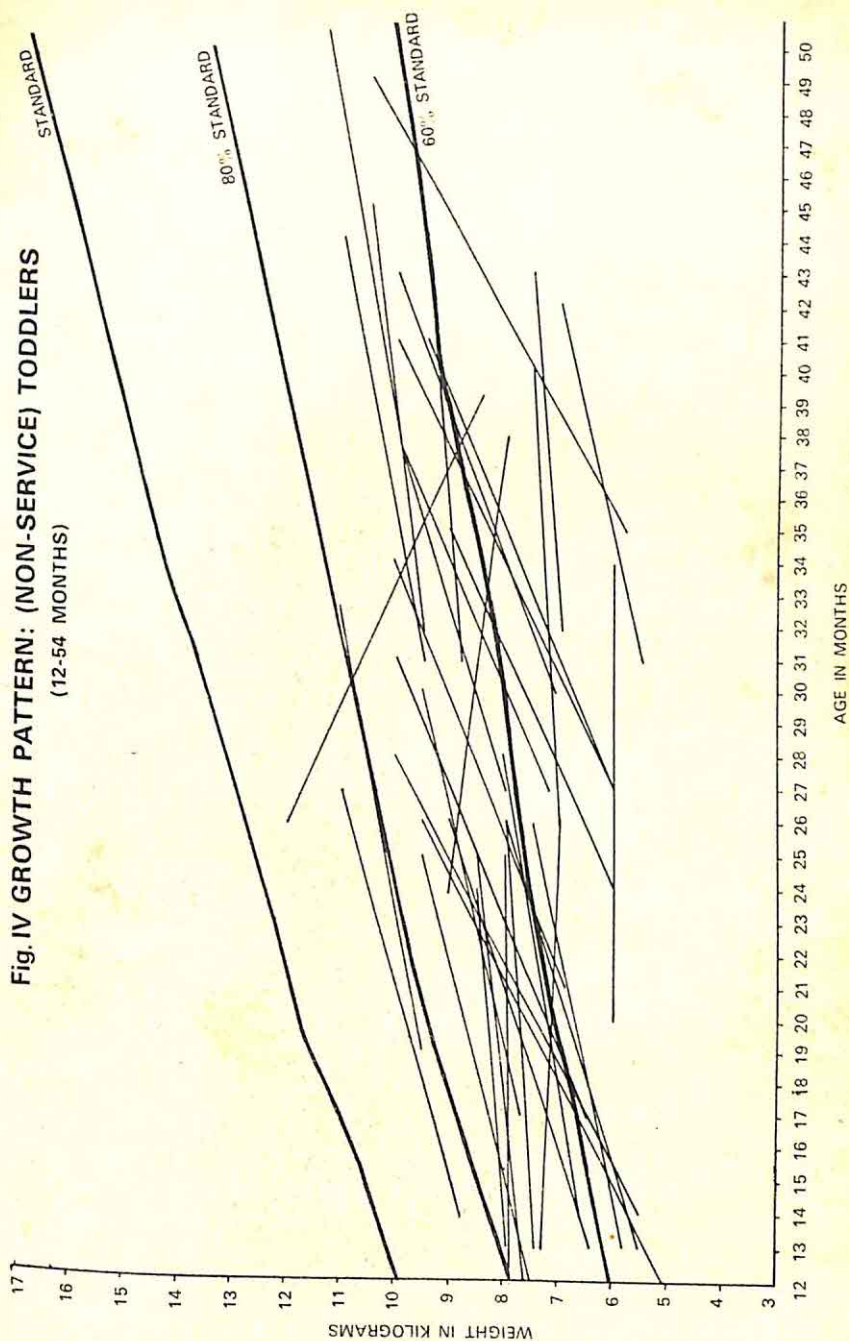
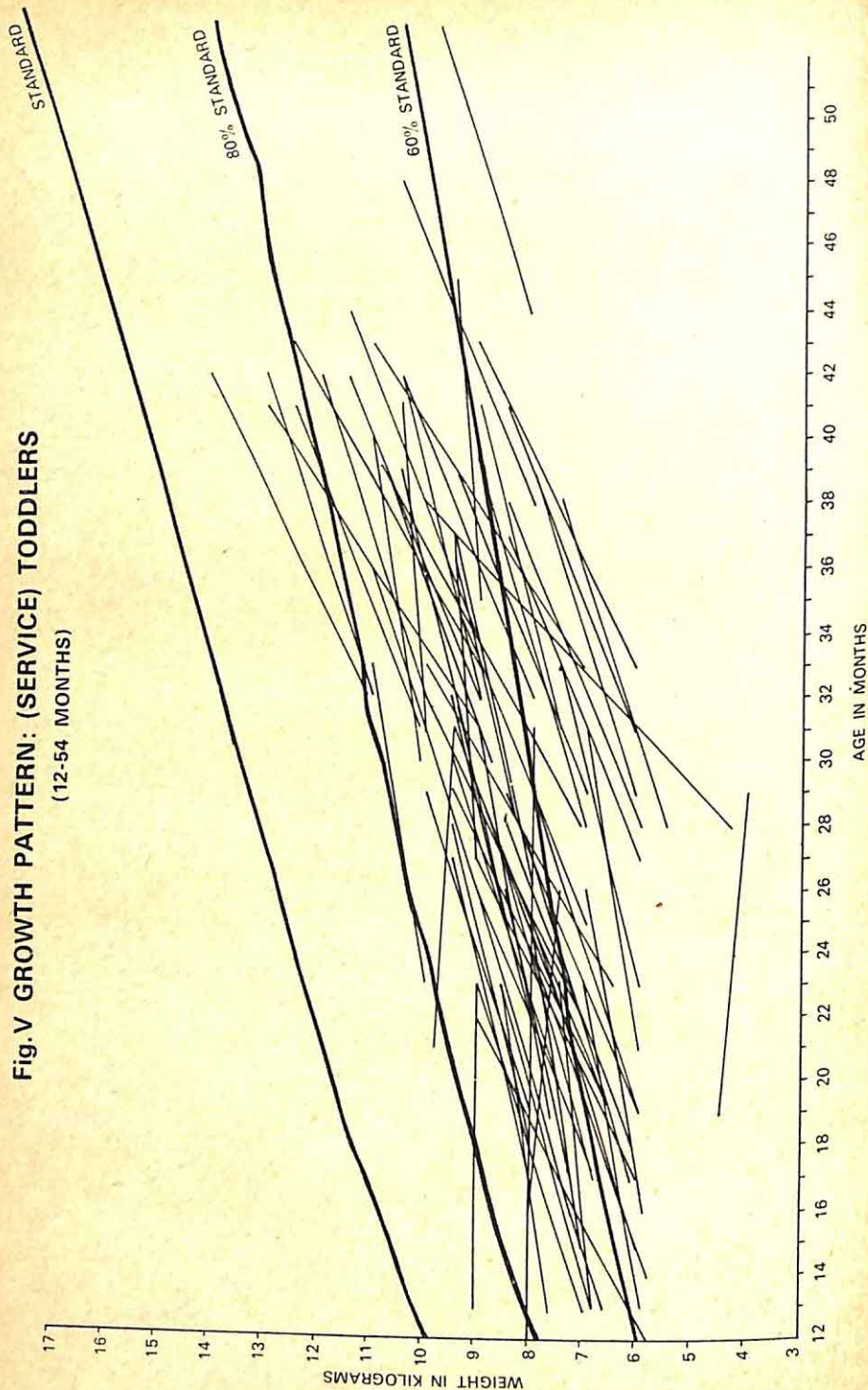




Fig.V GROWTH PATTERN: (SERVICE) TODDLERS  
(12-54 MONTHS)



## MOTOR AND MENTAL GROWTH OF INFANTS

Shalini Bhogle

The Bayley Scales: Validity and Reliability of the BSID; The Kit; Scoring — Training and Field Work — Analysis and Results — Phase I: The Major Hypothesis; Growth and Food Intake — Phase II: Motor and Mental Functions; Caste Groups; Literacy; Father's Occupation; Mother's Age; Sex of the Child; Sibling Order; Investigator's Rating of the Child's Level of Development; Presence or Absence of Mother; Benefit More Pronounced in Motor Development.

### *Abstract*

The healthy development of an infant is largely conditioned by the two major processes of *motor* and *mental* growth, based on heredity or the seed value, and the environment or the nurturance, respectively. Since the objective of the experimental project was to find out the effects of the action programme on the motor and the mental development of the children, this chapter deals with the influences of some environmental factors on the growth and development of the infants.

THE PROJECT WAS expected to have two kinds of effects: (i) directly observable and measurable, and (ii) subtle and qualitative. A mother and child receiving regular feeding, and benefiting from the child care programme over a long period should naturally improve in health. Similarly, a woman exposed to functional literacy and meeting a new group of people was expected to develop different attitudes.

The cumulative effect of the programme would be a healthier child and a mother with a new-found awareness. In the case of infants who otherwise do not get adequate food, the provision of supplementary food of desired quality should have rapid, observable and measurable effects. These children, we assumed, would be more responsive, alert and active. If a suitable test could be developed or obtained to show that the child in the target group was qualitatively better than the child deprived of such a programme, the effort can be considered



worthwhile. It was in this context that we turned to the revised Bayley Scales of Infant Development.<sup>1</sup>

### The Bayley Scales

The Bayley Scale of Infant Development (BSID) is based on the California Scales of Infant Development (1933, 1935).<sup>2</sup> It is designed to provide adequate measurement of development of infants for the first thirty months.

The BSID consists of three complementary parts: the mental scale, the motor scale and the infant behaviour record.

The mental scale includes basically the skills acquired in adaptive and language abilities. The adaptive behaviour is gauged with fine sensory motor adjustments to objects and situations, the coordination of eyes and hands in reaching and manipulation. The language behaviour broadly includes expressions, gestures, postural movements, vocalisation, words, phrases and sentences.

The motor scale provides a measure of the degree of control of the body; it is of value because it has a number of neurological implications: motor capacities of the child constitute the natural starting point for an estimate of the child's maturity. The infant behaviour record is useful mainly for clinical assessment and therefore was not used in the present study.

There are 167 items in the mental scale and 63 items in the motor scale. The items in these scales are arranged in order of difficulty.

*Validity and Reliability of the BSID:* The problem of adequate standardisation of the scale of ability for infants was overcome by obtaining normative data meeting the criteria for a reasonably ample and representative sample. Warner and Bayley (1966) have conducted a tester-observer, and test-retest reliability study of Bayley's revised scales for the first fifteen months. The test-retest reliability range for the mental scale was in the range of +0.55 to +0.89 and for the motor scale in the range of +0.53 to +0.91.

The BSID is similar in many respects to the Gesell scales (1925),<sup>3</sup> the Merrill Palmer scale (1931), the California First Year Mental scale (1947),<sup>4</sup> etc. We preferred to use the BSID largely because it measured the development for the age-group in which we were interested and provided separate scores for motor and mental growth. It had also been tried and used in India for Indian babies. Since ready-made norms developed by the Child Development Department of

M.S. University of Baroda (Gujarat) were available for Indian populations, we did not wish to develop norms of our own.

*The Kit:* Since the original kit prepared for American children was quite unsuited to Indian conditions, we assembled a new kit with all the necessary toys and testing boards. We took care that children liked the toys and accepted them and made a few modifications in the use of the walking board, staircase table and the chair. We used flat wooden planks instead of the walking board. We tested the climbing behaviour by making the child climb up the rocks nearby, instead of using a staircase. The table and the chair were eliminated totally: the child and the mother were seated on the floor, either inside the hut or outside, if the hut was too small or crowded.

*Scoring:* The scoring was done in the following way. A small child was tested as long as the investigator found that further items will not elicit any fresh response. In case of older children the test started not at item one but at a suitable test item at which the child could have easily responded positively. For example, if a child can stand or walk alone, items such as 'head balanced' or 'raises self to sitting positions', were omitted.

The score on motor and mental age of the child was ascertained in the following manner: (1) count the number of items beyond which the child could not respond; (2) subtract from this the actual number of items on which the child had failed; (3) look for the equivalent age norm for the score thus obtained. This was the motor age or the mental age of the child.

The chronological age of the child was assessed by finding out the festival or the full moon or the new moon nearest to the day of birth, and the actual number of days intervening between birth and the event. The investigator referred to the Hindu calendar of the year in which the baby was born and assessed the age accordingly. This was the chronological age.

The difference between these two ages was indicated by the plus or minus points and was called the deviation score. For example a child whose chronological age was 2.4, motor age was 2.9 and mental age was 2.1, had a motor deviation score of +0.5 and mental deviation score of -0.3. In order to assign a motor age or a mental age to a child, we have adopted 97 per cent norms developed by the Child Development Department of M.S. University of Baroda. It is the usual practice that when we do not develop our own norms, we adopt 50 per cent norms for testing. The norms developed in India were available



only for urban, healthy-born, upper middle class children. The sample for this study was from a backward rural area. Hence, we decided to use 97 per cent norms as a criterion for assessing the development of the children.

### **Training and Field Work**

For Phase I, there was only one investigator who conducted the complete testing for the Bench Mark Survey as well as for Resurvey. She also tested all the children during the Bench Mark Survey of Phase II. Another investigator joined her only for a period of two months for the Resurvey of Phase II. They were trained carefully about the purpose and methods of testing and were given the necessary theoretical background. An important criterion in selecting the investigators was that they liked children and were patient.

Each item was then explained to the investigators with the help of the manual and by demonstration with a doll. The test being quite long, it took nearly three days just to explain the 167 + 63 items. Then we went out first pre-testing with children in the neighbourhood. After testing each child, the investigators were told about their mistakes and were advised how to overcome a difficult situation. The second pre-testing was done in the field conditions to acquaint them with the actual field experience. They were also taught how to make decisions on the spot and make the testing interesting to the child and to his mother. The items were tested not in the serial order but piecewise. Items clustering around a certain toy or a board were taken together and recorded according to the behaviour observed. For example, horizontal eye coordination, vertical eye coordination, and circular eye coordination were tested once with a moving object, and later with the bell or the rattle.

The testing team visited the houses usually early in the morning when the child was happy and willing to play with others. The mothers, depending upon the time we visited and according to their pressure of work, either cooperated or showed a degree of **unwillingness**. But once the rapport was developed in the Bench Mark and for almost all the cases in the Resurvey, testing was not very difficult. We anticipated their suspicions and expectations and tried to be sympathetic and understanding. Our greatest problem was to keep the child undisturbed and complete the test without distraction. Sometimes, there were too many onlookers and this involved the risk



of the child running away or withdrawing. The toys, though not very flashy, were quite interesting and attractive for the rural children. Often, a cooperative child got annoyed when we withdrew the toys. There were also a few unpleasant situations, when a mother deliberately went out as she saw us coming, or the elder women would not permit us to touch the child. Apart from these, the response was fairly good and we usually completed the testing in the allotted time.

### **Analysis and Results**

The project, conducted in 2 phases, covered 8 villages in Phase I from January 1973 to April 1974. Two of these eight villages were controlled and the remaining six villages, called treatment villages, were exposed to the action programme. Over 100 children were tested in the Bench Mark but due to migration, absenteeism, and a little delay in the Resurvey, only 54 children were re-tested in the Resurvey. In Phase II, 22 villages were surveyed and 529 children tested for the Bench Mark. But only 115 children were found eligible for the Resurvey.

The criterion of eligibility was that the child should be less than 30 months old, and should have been included in the Bench Mark and that its mother should have participated in the programme for at least 50 per cent of the time. (This is a higher criterion level of participation than used earlier, resulting in fewer eligible children.)

In both the phases, the response in respect of functional literacy was very poor and very few children were found eligible for Resurvey. We, therefore, decided to combine the results of CONT and FLIT for the analysis of the data. We also have attempted to study a few variables which are likely to have some influence on the development of the infant. It was not possible to study any variables in the first Phase since the total number of children was very small. We therefore restricted our analysis of the first Phase to finding out the effects of the experimental treatments on the development of a child.

Throughout our presentation of results we have based our observations and a few passing conclusions, on one score value, namely, deviation of motor age or deviation of mental age. This deviation is the difference of observed motor or mental age and the calculated chronological age of a child on the day of testing. Thus, we have assigned to a child certain motor deviation score and a mental deviation score. We used this value for the interpretation of the Bench



Mark Survey and also to assess the effects (if any) of the treatment on the growth of the child when the child was re-tested after receiving the treatment. The results of Phase II are based on mean deviation scores for motor and mental age.

### Phase I

In the first Phase, the Bayley Scale of Infant Development was administered to 54 children. These 54 children represented four treatment groups. The control group consisted of 19 children. The functional literacy (FLIT) group where mothers were exposed to literacy classes consisted of 4 children; only four mothers attended the classes till the end of the programme. The third group called the MCC included 19 children; in this group the mother and the child (MCC) received regular feeding and health care. The fourth group had the advantage of both the MCC and the functional literacy (MCC+FLIT).

The total sample of 54 children was spread over an age range of approximately 17 months (14 to 30 months) and four treatment groups. Statistically, there were not even two children to represent each month and belonging to the same treatment group. Thus, even if we had decided to combine scores of children in three-month groups on the basis of some assumed criterion, we would not have got an adequate number for any kind of statistical treatment. In fact any effort to arrive at any inferential statistics with such a small sample would be unpardonable. Under these conditions, it was only logical that we gave a descriptive analysis of our data.

*The Major Hypothesis:* The major hypothesis for the First Phase results was that the development of the children in the Resurvey will follow a pattern: (i)  $CONT < MCC < MCC+FLIT$ ; (2)  $(CONT \text{ and } FLIT) < (MCC \text{ and } MCC+FLIT)$ . This hypothesis was supported to a certain extent as shown in Table I (see Appendix 15).

It will be seen from Table I that children in the MCC group have benefited the most from the treatment, followed by children in the MCC+FLIT treatment. There are only four children in the FLIT treatment varying in age. We have, therefore, no comments on the effect of the FLIT treatment. Children in the control group show consistent and negative deviations which shows that these children who were not provided with any supplementary feeding and health care have lagged behind in their mental and motor development.

Columns 2, 5, 8 and 11 of Table I give the motor deviation scores for the four treatment groups. These columns show that deviations of children in column 8, i.e., the MCC treatment, are generally positive. In other words, the motor age of these children is higher than their chronological age. Children in this group were receiving supplementary food and also the necessary medical care to prevent or cure illness.

Column 11 shows the motor development of children in the MCC+FLIT villages. We expected the best results from this group because in addition to the MCC treatment, the mothers of these children were exposed to functional literacy which we thought should not only improve the childrens' motor age but mental age too. We assumed that by exposing these women to functional literacy there will be a certain change in the attitude of these women which would reflect on the development of language ability. But looking into columns 3, 6, 9, and 12 which show the mental age deviation, we find that the trend of deviation scores is somewhat similar to motor age deviation and again the children in the MCC group appear to have benefited the most.

*Growth and Food Intake:* Studies in child development give evidence of the fact that growth and development of children depends significantly on the amount of food and also the quality of food. The MCC and MCC+FLIT treatment children received supplementary food which was showing immediate results.

Another interesting finding from Table I is that until the age of 18 to 20 months, children in the three groups do not show appreciable variation. But after the age of 20 months, children in MCC and MCC+FLIT group show an advantage over the control group. It is possible that supplementary food benefits the children beyond 18 months more significantly. This needs further investigation.

If we compare the deviation scores of motor growth and mental growth of the babies in the study in general, we find that the pace of development is different for these two processes of development. Deviations in motor age have been consistently more positive than mental deviations. This may be due to the fact that mental development requires a certain quality of environment which was not provided by the programme.



## Phase II

The method and approach of Phase II was similar to that of Phase I but this time we had our experience to guide us. We treated children from 1 month to 18 months for the Bench Mark so that these children continue to be eligible for Resurvey.

Since we tested a reasonably large number of children, we decided to study the effect of experimental manipulation and controlling for a few variables. It was hypothesised that variables such as caste, age of the mother, occupation and level of literacy of the father (ideally it should have been mother's literacy, but all our sample mothers were illiterate) not only influence the growth and development of their infant children but to a certain extent influence their ability to receive the programme and make the best use of it. The results of these analyses are given in Tables III, IV, V and VI (see Appendix 15). These tables give a comparative account of the effects of the treatment for the Bench Mark as well as Resurvey.

*Motor and Mental Functions:* In addition, certain variables such as sex, sibling order of the child, health status of the child and the presence or absence of mother of the child at the time of testing, were analysed and are presented in Tables VII to X (see Appendix 15). A person who has observed children carefully, and who is quite acquainted with testing infants, knows well that each of these variables can affect and interfere with the testing conditions and therefore the performance of a child. There are studies to support the fact that these factors have a positive or negative effect on the child. In Table II (see Appendix 15) we have attempted to compare the development of motor and mental functions in general and also to study separately the effects of these treatments on the development of the child.

The dependent variables throughout the results were deviation in motor and mental age scores for a child. Just as the large number of children tested in Phase II encouraged us to study a few additional variables, it has also limited our scope to a certain extent. For example it was not possible to study the growth and development of individual child as we could do in Phase I. We have therefore based our results mainly on the average of deviation scores of children grouped in a certain category or a certain specified age-group. Some of these groups were large and therefore could justify the interpretation. But some other groups were rather small and one may question the reliability of our findings. Hence, it was felt more desirable to give



qualitative interpretations of our findings rather than highly statistical and quantitative ones.

Table II reveals that the findings of Phase II are somewhat similar to those of Phase I. The children in MCC and MCC+FLIT treatment definitely show an advantage over the children in the non-service control group. The motor age is not only positive but is of a significantly higher order, except for the age-group 13 to 15 months. The average mental age deviation shows that children at Resurvey in the treatment group have surely benefited by the programme. The negative deviations appearing for the MCC and MCC+FLIT children are for only a few children.

The significant finding of Table II is that while motor development shows a positive gain for treatment children, the deviations in mental development are negative. This is mainly due to the fact that mental development of a child requires a certain quality of environment, a certain awareness and attitude on the part of parents which is not so necessary for the motor growth of an infant. This awareness and attitude is a cumulative outcome of literacy level, caste, poverty level, exposure to mass media, etc. Our sample parents are deprived of all these contributing factors.

*Caste Groups:* The three major caste groups in our sample are scheduled castes, backward castes and upper castes. In the social hierarchy the scheduled castes form the lowest rung; next in order are backward castes and then the upper castes. Table III (see Appendix 15) shows that the performance of children in these three groups varies to a considerable extent.

Table III shows that while there was no uniform difference in the performance of the children in the three caste groups at Bench Mark level, there was clear observable difference in their performance in the Resurvey. This was mainly because of the differences in the potential to receive and benefit from the programme. In the MCC and MCC+FLIT programme (that is, the action group) the average motor deviation in upper castes and backward castes is definitely higher and positive compared to that of scheduled castes. A similar trend is observed in their mental development.

*Literacy:* Literacy of the father was an important variable in our context of impoverished rural environment. Literacy does not mean for us the mere knowledge of three R's but more importantly, the difference in attitude. A literate father has a certain awareness and feels that he is quite different from an illiterate. We expected that this fact



should influence particularly the mental development of a child. Table IV (see Appendix 15) gives the results.

Table IV supports our assumption to a considerable extent. The deviation scores (particularly the mental deviation) in all the treatments in both the Bench Mark and the Resurvey show that the average mental deviations of children of literate fathers are consistently of a higher parameter than those of illiterate fathers. The trend continues even in the Resurvey of MCC+FLIT villages where the deviations are all negative for mental development. It indicates that children of literate fathers are mentally of a superior order compared to children of illiterate fathers.

Even amongst the so-called literate fathers, only a few had schooling up to seventh class. But this amount of exposure has changed their attitude. On the basis of these results, one may venture to conclude that literacy of the fathers is a crucial factor in the development of their children.

*Father's Occupation:* Occupation has a specific meaning and people are classified in surveys as professionals, semi-professionals, businessmen, skilled or unskilled workers, artisans, etc. But our sample mainly included agricultural labourers with a sprinkling of artisans and shepherds. Hence, we decided to divide the sample into two major categories of labourers working on their own farms and those working on others' land. This classification thus divides the sample into economic groups. Table V (see Appendix 15) gives the results.

Table V shows that children whose fathers worked on their own land or, in other words, possessed their own land, have benefited more by the programme. Even the results of Bench Mark show that children whose fathers worked on their own land tend to have higher scores than children whose fathers worked on others' land. This variable reflects the fact that fathers who worked on their own land were economically better off than the fathers working on others' land. This factor combined with literacy can become an important variable to assess and hypothesise about the growth pattern of their children. Tentatively, we may conclude that children born to fathers of higher socio-economic status get higher scores than children deprived of similar background.

*Mother's Age:* There are diverse opinions and findings about this variable. We believe that if a young mother had fewer children, she would be more interested in her child. She also may not have strong

biases and therefore would receive the programme with greater enthusiasm. On the other hand, it could also be argued that an old mother who had suffered greater economic hazards should come forward readily to participate in the programme. Our young mothers are in the age-group of 24 years and below. The old mothers are 25 years and above. Table VI (see Appendix 15) shows that the age of the mother does not affect the development of her children.

The data provided in Table VI do not show any consistent difference in the deviation scores of children born to young mothers and to old mothers. In the MCC group, children of old mothers have gained significantly by the programme in motor growth. But the MCC + FLIT action children do not show a similar gain. Thus, our results fail to indicate any effect of age of the mother on the development of the child.

*Sex of the Child:* Almost all over India we find a noticeable difference in the attitude of a mother towards her son and her attitude towards her daughter. The favoured and preferred child is always the son. The probable justification could be that the boy would remain in the home during the mother's old age, and therefore mothers take extra care of a boy. Another important reason is that in our patriarchal society, it is the age-old belief that boys are superior to girls and therefore must be protected and properly attended to.

Table VII (see Appendix 15) shows that in the control group, the performance of girls was better than that of boys. But in the treatment group, we find that the pattern is reversed. The boys in the MCC and joint treatment supercede the girls and show consistently higher scores in motor as well as in mental growth. This shows that boys benefited more from the programme than the girls.

*Sibling Order:* The children for this variable were divided into two categories: the first category included children who were either first born or second born. The second category was sibling order third and above, where a mother becomes a little indifferent; for later pregnancies, sometimes the child is unwanted. Our results however fail to indicate any trend. But they definitely point out that children in the treatment group show superior motor abilities.

*Investigator's Rating of the Child's Level of Development:* This variable was tested against the rating of the investigator. The investigator was asked to assess if the child was retarded, sick, normal or advanced, on the basis of her experience of testing about 1,000 children in the course of the two phases of the project. The



investigator's rating appears to be associated with performance of the child in the test situation. Table IX shows the results. (See Appendix 15).

Table IX gives the impression that the health status of the child is the most important determining factor in the measurement of development. We find that a normal or advanced child has a consistent positive deviation on motor age score and mental age but for the exception of normal children in MCC+FLIT treatment. This finding could indicate two trends. First, normal and advanced children have definitely benefited by the programme. It could also be argued that these children do not need any such programme.

*Presence or Absence of Mother:* There is a general feeling that a child assisted by his mother should perform better than a child not assisted by his mother. Our results do not show any noticeable difference in the performance of the mental tasks as a result of the presence of the mother. However, they show some difference with respect to the performance of physical tasks.

Table X (see Appendix 15) shows that if 'others' were present at the time of testing rather than the mother, the children showed poorer physical performance. Maybe the mother was being interviewed or that she did not want to be bothered. Obviously, the presence of the mother puts the child in an advantageous position. It is also true that a mother knows best how to elicit the required response from her child.

*Benefit More Pronounced in Motor Development:* The data provided in the tables for Phase I and Phase II bring out clearly the fact that the children in the action programme villages have definitely benefited by the treatment. This benefit was more pronounced in motor development. It was satisfying to note that motor growth which depended to a large extent on quantity of food and proper prevention from illness was definitely accelerated by our programme. Another interesting observation is that mental growth which requires a more conducive social environment, in addition to necessary basic food and health services, showed some positive gains where the necessary mental attitude was present, through the father's literacy and economic stability.

Another consistent trend was the difference in the development of children between the MCC and the MCC+FLIT treatment. Children in the latter group have not improved as much as children in the MCC treatment.

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TABLE II: Age of the child and the effect of treatments on the motor and mental growth (Phase II)

Treatments	Bench Mark			Resurvey						
	Age group (in months)	N	Average motor deviation	Average mental deviation	Age group (in months)	N	Average motor deviation	Average mental deviation	Average motor age	Average mental age
1	2	3	4	5	6	7	8	9	10	11
CONT and FLIT	0-3	2	+ .450	+ .450	0-3					
	4-6	17	- .117	- .188	4-6					
	7-9	43	+ .320	+ .111	7-9					
	10-12	88	- .009	+ .050	10-12		+ 1.500	+ 2.900	17.400	18.80
	13-15	74	- 18	- .054	13-15	1	- 2.633	- 2.366	15.166	15.21
	16-18	4	+ .975	+ .075	16-18	3	- 1.289	+ 1.590	21.720	22.98
	19+	6	+ .450	+ .250	19+	27	- 1.329	0.003		
		234	+ .073	+ .020		31				
	0-3	1	(-)	(-)	0-3					
	4-6	7	+ .757	+ .614	4-6					
Total MCC	7-9	37	+ .191	+ .043	7-9		+ 2.100	+ .900	12.900	11.70
	10-12	61	+ .072	- .067	10-12	1	+ 1.750	+ .100	16.250	14.60
	13-15	38	+ .055	- .239	13-15	2	+ 1.480	- 1.740	18.500	15.28
	16-18	—	—	—	16-18	5	+ 2.640	- 1.110	26.470	22.71
	19+	4	+ .200	- .250	19+	30	+ 2.431	- 1.076		
		148	+ .133	- .056		382				
Total										

(Contd.)



TABLE II (Contd.)

1	2	3	4	5	6	7	8	9	10	11
MCC and MCC+FLIT	0-3 4-6 7-9 10-12 13-15 16-18 19+	— 16 42 69 20 — —	— -.900 +.135 +.239 -.155 — —	— -.850 +.142 -.042 +.470 — —	0-3 4-6 7-9 10-12 13-15 16-18 19+	2 7 9 18 36	+1.850 +3.520 +2.330 +2.805 +2.775	+1.250 +0.740 -1.730 -2.160 -1.302	13.000 17.910 19.533 28.300	12.40 15.12 15.46 23.34
Total		147	+.032	-.136						

TABLE III: Motor and mental deviation scores during Bench Mark Survey and Resurvey by major caste groups and experimental treatments (Phase II)

Treatments	Caste Groups	Bench Mark Survey			Resurvey		
		N	Average motor deviation	Average mental deviation	N	Average motor deviation	Average mental deviation
I	2	3	4	5	6	7	8
CONT+FLIT	Scheduled castes	33	-.460	-.545	4	-3.770	-1.125
	Backward castes	159	+.107	-.057	17	-2.030	-0.888
	Upper castes	42	+.361	+.320	10	+0.850	+1.970
	Total	234	+.073	-.020	31	-1.329	+0.003
MCC	Scheduled castes	21	+.252	+.261	2	-2.150	-3.650
	Backward castes	109	+.083	-.112	32	+2.580	-1.093
	Upper castes	18	+.294	-.083	4	+3.520	+0.350
	Total	148	+.133	-.056	38	+2.431	-1.076
MCC+FLIT	Scheduled castes	29	+.617	+.255	11	+0.570	-4.363
	Backward castes	106	-.148	-.255	19	+4.050	+0.326
	Upper castes	12	+.208	-.025	6	+2.760	-0.850
	Total	147	+.032	-.136	36	+2.775	-1.302



TABLE IV: Motor and mental deviation scores by literacy level of father and experimental treatments (Phase II)

Treatments	Bench Mark			Resurvey		
	N	Average motor deviation	Average mental deviation	N	Average motor deviation	Average mental deviation
CONT and FLIT	Illiterate	+0.021	-.040	24	-2.06	-.912
	Literate	+0.355	-.352	7	+1.18	+3.14
	Total	+0.073	+0.020	31	-1.32	0.003
MCC	Illiterate	+0.090	-.093	29	+2.237	-1.465
	Literate	+0.262	+0.056	9	+3.055	+1.77
	Total	+0.133	-.056	38	+2.431	-1.076
MCC+FLIT	Illiterate	-.035	-.186	27	+3.04	-1.555
	Literate	+0.323	-.088	9	+1.97	-.544
	Total	+0.032	-.136	36	+2.77	-1.302

TABLE V: Motor and mental deviation scores by father's occupation and experimental treatments (Phase II)

Treatments	Father's occupation	Bench Mark		Resurvey			
		N	Average motor deviation	Average mental deviation	N	Average motor deviation	Average mental deviation
1	2	3	4	5	6	7	8
CONT+FLIT	Working on others' land	115	+0.050	-.053	12	-2.60	-0.68
	Working on own land	119	+0.095	+0.091	19	-0.52	+0.56
	Total	234	+0.073	+0.020	31	-1.329	+0.003
MCC	Working on others' land	55	+0.229	+0.107	17	+0.97	-1.59
	Working on own land	93	0.05	-.046	21	+2.95	-0.89
	Total	148	+0.133	-.05	38	+2.43	-1.07
MCC+FLIT	Working on others' land	59	-.170	-.317	9	+1.51	-2.17
	Working on own land	70	+0.313	+0.112	27	+3.19	-1.01
	Total	129	+0.032	-.136	36	+2.77	-1.30



TABLE VI: Motor and mental deviations by age of mother and experimental treatments (Phase II)

Treatments	Categories	Bench Mark			Resurvey		
		N	Average motor deviation	Average mental deviation	N	Average motor deviation	Average mental deviation
CONT and FLIT	Young mothers	108	-.045	-.137	13	-1.329	+0.000
	Old mothers	126	+.174	+.154	18	-0.492	-0.276
	Total	234	+.073	+.020	31	-1.933	+0.205
MCC	Young mothers	70	+.128	+.085	17	+0.505	-2.200
	Old mothers	78	+.137	-.183	21	+3.990	-0.166
	Total	148	+.133	-.056	38	+2.431	+0.000
MCC+FLIT	Young mothers	59	-.173	-.294	12	+2.375	-0.780
	Old mothers	88	+.168	-.029	24	+2.975	-1.579
	Total	147	+.032	-.136	36	+2.775	-1.300

TABLE VII: Motor and mental deviations by sex of the child and experimental treatments (Phase II, Resurvey)

Treatments	Categories	N	Average motor deviation	Average mental deviation
CONT and FLIT	Boy	13	-2.069	
	Girl	18	-.794	
	Total	31	-1.329	
MCC	Boy	18	+3.789	-.233
	Girl	20	+1.210	-1.83
	Total	38	+2.431	-1.076
MCC+FLIT	Boy	18	+3.372	-0.59
	Girl	18	+2.177	-2.01
	Total	36	+2.775	-1.30

TABLE VIII: Motor and mental deviations scores by sibling order and experimental treatments (Phase II, Resurvey)

Treatments	Sibling order	N	Average motor deviation	Average mental deviation
CONT and FLIT	1 and 2	12	-1.625	-1.691
	3+	19	-1.142	+1.073
	Total	31	-1.32	0.003
MCC	1 and 2	11	+1.718	-1.527
	3+	27	+2.72	-.892
	Total	38	2.43	-1.07
MCC+FLIT	1 and 2	7	+3.18	+.40
	3+	29	+2.67	-1.713
	Total	36	2.77	-1.30



TABLE IX: Motor and mental deviation scores by Investigator's rating of the child's level of development by treatments (Phase II, Resurvey)

Treatments	Categories	N	Average motor age	Average mental age
CONT and FLIT	Retarded	11	-3.218	-1.981
	Sick	6	-2.666	-4.216
	Normal	14	+7.28	+3.214
	Advanced	0	—	—
	Total	31	-1.32	0.003
MCC	Retarded	12	-.858	-4.916
	Sick	3	+.633	-0.283
	Normal	22	+4.181	+.790
	Advanced	1	+8.80	+1.40
	Total	38	+2.43	-1.07
MCC+FLIT	Retarded	6	+.500	-5.266
	Sick	3	+.700	0.0
	Normal	24	+2.99	-1.02
	Advanced	3	+7.66	+3.066
	Total	36	+2.77	-1.30

TABLE X: Motor and mental deviation scores by presence or absence of mother and experimental treatments (Phase II, Resurvey)

Treatments	Categories	N	Average motor deviation	Average mental deviation
CONT	Mother present	17	-.541	-.394
	Others	14	-.293	+.062
	Total	31	-1.327	0.003
MCC	Mother present	25	+2.172	-1.252
	Others	13	+.552	-.13
	Total	38	+2.43	-1.07
MCC+FLIT	Mother present	18	+2.00	-.994
	Others	18	+.74	-.337
	Total	36	+2.77	-1.30

## CHAPTER XXI

# COGNITIVE DEVELOPMENT

**B.B. Chatterjee**

Instrument for Measuring Cognitive Development: Test Material — Findings — Time taken to Complete the Design — Total Number of Pieces Used — Number of Sub-designs Included in the Design — Area Covered by the Design — Nature of Choice of Colour and Shape of Mosaic Pieces — Comparison with Other Groups — Qualitative Aspects of Mosaic Designs — Implications of Findings — Artistic Quality of the Mosaics.

### *Abstract*

The results of the present study seem to indicate that the mosaic test shows good promise for indexing changes in cognitive functioning that may be concomitant outcomes of non-formal training of adult learners. A follow-up after several years may reveal some further interesting trends in the sphere of cognitive functioning.

TRADITIONALLY, PSYCHOLOGICAL PROCESSES have been classified under three broad heads: Cognition, Emotion, and Conation. Cognition deals with the problem of 'how man gains information and understanding of the world about him' (Scheerer, 1954, p. 91). The emphasis is on the inferred perceptual organisations as mediators between stimulus pattern and behaviour. Cognition begins with perception, but goes beyond that. Operations such as judgement, selection, assessment, classification, measurement, matching, comparison, differentiation and integration comprise cognition.

The subjects of the present study are adult women. It is a well-known fact that the process of cognitive development is intimately related to growth and maturation. For example, it is known that growth of intelligence is rapid during infancy and childhood, and begins to taper off thereafter to reach almost its asymptote by about 16 or 18 years of age. The subjects of the present study, being adult, could be assumed to have reached in general their asymptotic peak level of intelligence. However, the novel and systematic stimulation



received from the non-formal education programme, which is a built-in feature of the present project, affects the cognitive development of these subjects, and is worth probing. These subjects possess one common characteristic – *they were illiterate* at the time the programme was started. The intensive and systematic training programme undergone by these illiterate or near-literate subjects may be expected to exercise some impact upon their cognitive processes, in certain subtle ways. This can be found out by obtaining some data on some suitable cognitive task from the subjects, first, before the experiment had started, and then, after the subjects had undergone the training programme.

### **Instrument for Measuring Cognitive Development**

While selecting suitable instrument for measuring cognitive development of the subjects, we have to keep the following limiting factors in mind:

- (a) The subjects are illiterate.
- (b) The subjects are adults, hence usual tests of measuring intelligence will be insensitive.
- (c) The test has to be such as to yield quantitative measures, rather than qualitative products, assessment of which involves subjective judgement.

After some preliminary search, it was decided to use the Indian Adaptation of the Lowenfeld Mosaic Test for this purpose. This test is generally known as a 'performance type' projective test, or what Bell (1949) has described as 'expressive movement' projective test. Numerous studies (see summary by Chatterjee, 1970) have shown that some of the measures derived from the administration of the mosaic test are intimately related to cognitive development of the subject.

*Test Material:* The Indian Adaptation of the Lowenfeld Mosaic Test requires the subject to fabricate a design on a tray by arranging brightly coloured plastic pieces, 360 of which are available in combinations of six shapes and six colours. The choice of the design is left entirely to the subject. He or she can choose any number of pieces of any colour-and-shape combinations.

A permanent replica of the design made by the subject is obtained. Certain purely objective features of the mosaic design, such as

'number of pieces used', 'total time taken to complete the mosaic', 'area covered by the design', 'number of sub-designs used', etc. are easily and accurately scored.

In this study, certain subjective or qualitative features of the design were also assessed by the special rating scale developed for this purpose earlier [Sharma and Chatterjee, 1967 (a), 1967 (b); Chatterjee, 1971 (b)]. This scale is a composite of three separate scales.

- i P-scale, for measuring mainly pattern qualities of the design;
- ii A-scale, for measuring mainly aesthetic qualities of the design; and
- iii M-scale, for measuring a few miscellaneous qualities of the design.

The P-scale and A-scale contain six items each; the M-scale contains three items. Each item is in the form of a 3-point graphic rating sub-scale. The minimum score for the full scale is 15 and maximum is 45.

In the present study the mosaic test was administered on 199 subjects during the pre-treatment stage. During the post-treatment stage, only 133 of these subjects were available for administering the mosaic test a second time. This number was further altered to 131 for which comparison between pre- and post-test measures has been possible. The findings of this study are based upon the performance of these 133 and 131 subjects only.

## **Findings**

Findings on four objective features of the subjects' performance on the mosaic test will be described first. As has been described earlier, there are four treatment groups in this study: the control group (CONT), and the three experimental groups, FLIT, MCC, and MCC+FLIT. We shall now study how each of these four groups has performed the task, as measured by four objectively measurable features of their performances.

### **Time Taken to Complete the Design**

The mean and standard deviation of the time taken to complete the mosaic design, for each of the four groups, are shown in Table I for both pre-training and post-training administrations of the test.

The findings reported in Table I are quite interesting for the reason that during the initial pre-training phase there were considerable



TABLE I: Mean and standard deviation of 'time taken' to complete the mosaic design for different groups of subjects

Group	N	Mean time- (Sec)	S.D.	Mean time (Sec)	S.D.	Mean time (Sec)	S.D.
1. CONT	43	58.674	94.875	141.442	99.492	-17.232	+4.617
2. FLIT	14	99.071	53.593	273.643	138.814	+174.572	+84.981
3. MCC	43	147.791	118.063	225.372	113.918	+77.781	+4.145
4. MCC+ FLIT	33	208.424	139.041	362.061	220.047	+153.637	+81.006
5. 3 Exp. groups combined	90	162.444			283.000	+120.556	

differences between the average 'time taken' by the four different groups. Likewise, variability within each group was also considerable, and was different from group to group. However, the 'mean time taken' by the control group is lower in the post-treatment stage, compared to the pre-treatment stage. But in all the three experimental groups, there is considerable increase in the means of 'time taken' at the post-treatment stage. This gain is maximum for the FLIT group, which received training in literacy, and it is minimum in the MCC group, which received training in mother and child care practices. The joint group, which received training in both literacy and mother and child care, has made a gain intermediate between the two one-effect treatment groups. It is also to be noted that the variability within two of experimental groups has increased very much during the post-training stage. In the control group and the MCC group the variability has increased, but only slightly.

### **Total Number of Pieces Used**

How many pieces are to be used for fabricating a design is a matter of choice for the subject. What effect the experimental treatments have upon this process of choice can be studied by examining the mean number of pieces used in making the design, by each group during the pre-training and post-training stages. These are shown in Table II.

The results reported in Table II with regard to 'total number' of pieces used during the pre-training and post-training stages are in general similar to those for the measure of 'time taken', with a few

TABLE II: Mean and standard deviation of 'total number of pieces' used to fabricate the mosaic design, for different groups of subjects

Group	N	Pre-training		Post-training		Gain (post - pre)	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1. CONT	43	12.33	7.80	17.84	11.47	+5.51	+3.67
2. FLIT	14	11.93	6.50	15.79	6.87	+3.86	+0.37
3. MCC	43	20.21	13.80	19.67	10.39	-0.54	-3.41
4. MCC+ FLIT	33	25.27	20.23	30.85	19.38	+5.58	-0.85
5. 3 Exp. groups	90	20.78		23.17		+3.61	

exceptions. First, it is seen that the control group has also gained, on the average +5.51 pieces in the post-treatment stage over the pre-treatment stage. The MCC group has not made any gain, but has lost slightly. But the maximum gain has been made by the joint group, though in absolute size it is only slightly larger than that made by the control group. However, the variability for both MCC and joint groups has gone down in the post-treatment stage, and that for the FLIT group has increased only slightly. For the control group it has gone up.

### Number of Sub-designs Included in the Design

The design made by arrangement of the mosaic pieces may consist of several distinct parts, or it may be a whole, single piece. Whether the training experience has any effect upon this aspect of the construction of the mosaic designs can be studied by examining the mean number of sub-designs used by the different groups, before and after the training. These are shown in Table III.

It is clear from Table III that with the exception of the MCC group, all the other groups, including the control group, made gains in the mean number of sub-designs used. The greatest gain has been made by the 'literacy training' group where even the group variability has been reduced in the post-treatment stage. The gain by the joint group is almost comparable; however, here the group variability has increased considerably during the post-training performance - indicating that some subjects gained much, and others gained little, or perhaps lost - in terms of number of sub-designs used



TABLE III: Mean and standard deviation of 'number of sub-designs' included in the mosaic designs by different groups of subjects

Group	N	Pre-training		Post-training		Gain (post - pre)	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1. CONT	43	1.30	1.15	1.37	1.45	+0.07	+0.30
2. FLIT	14	1.07	1.49	1.57	0.85	+0.50	-0.64
3. MCC	43	1.51	1.45	1.30	1.01	-0.21	-0.44
4. MCC+							
FLIT	33	1.79	1.82	2.24	3.14	+0.45	+1.32
5. 3 Exp. groups	90	1.54		1.69		+0.15	

in their respective mosaic designs.

### Area Covered by the Design

How much area of the tray is covered by the design can be measured fairly accurately, and this can be expressed as a percentage of the total area of the tray available. These mean percentages of tray-covered area by the designs of the four different groups of subjects are shown in Table IV.

TABLE IV: Mean and standard deviation of area of tray covered by the designs made by different groups of subjects

Group	N	Pre-treatment		Post-treatment		Gain (post - pre)	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1. CONT	43	31.33	11.99	37.05	17.73	+5.72	+5.74
2. FLIT	14	34.43	14.58	41.50	14.85	+7.07	+0.27
3. MCC	43	40.77	19.28	42.91	18.48	+2.14	-0.80
4. MCC+	33	44.58	24.40	44.97	19.37	+0.39	-5.03
FLIT							
5. 3 Exp. groups	90	41.18		43.44		+2.26	

Examination of the mean values given in Table IV will show that all the groups appeared to have made gains in this measure of 'area covered' by the design. The mean gain is highest for the FLIT group,

(7.07%), followed by the control group (+5.72%), MCC group (+2.14%), the joint group coming last (+0.39%). However, the variability in the control group has registered very great increase in the post-treatment session. In the FLIT group also, the variability has increased only slightly. But in the remaining two experimental groups, variability has decreased; specially in the joint group it has gone down appreciably.

### **Nature of Choice of Colour and Shape of Mosaic Pieces**

The mosaic pieces come in 36 distinct combinations of six different colours and six different shapes. The subject can choose whichever colour-shape combination he likes, and up to a limit of 10 pieces from each colour-shape combination. Analysis may reveal how the subjects have preferred certain colours, and certain shapes, and certain colour-shape combinations. Whether the choice patterns are stable or not may also be studied by looking into the frequencies of the choice of different shapes or different colours, and of different colour-shape combinations, for pre-treatment and post-treatment sessions. The results of the statistical analysis of these aspects of the mosaic designs made by the subjects are presented in Table V. The means of the number of pieces used in six different colours by the subjects of the eight different villages, during the pre-treatment and post-treatment sessions are shown in Table V.

A close examination of the various mean values shown in Table V will reveal a few interesting trends. First, if the marginal means are considered for all colours together, we note that the means for the pre-treatment and post-treatment sessions do not show much fluctuation – they are quite stable. Five groups have registered increases and three groups have registered decreases. The magnitude of the increase in the marginal means is usually small, same in one village group, viz. 7. The same type of stability is seen in the means for the six different colours, when all the 8 village groups are considered together. However, within each group, some changes have taken place, in the choice of colours, from the pre-treatment to the post-treatment session. Some colours have been chosen more frequently and others less frequently. However, such fluctuations are not very great – stability being more characteristic of the means for the choice of the six different colours.

The means of the number of pieces chosen in the six different



TABLE V: Means of the number of pieces chosen in six different colours by the subjects of the eight different villages, for constructing the mosaic designs, in the pre-training and post-training sessions

Village identi- fication no.	Session	N	Colours						
			Blue	Green	Yellow	Pink	Red	Black	All colours
1.	Pre-	25	1.08	0.84	2.08	3.36	4.20	0.44	12.00
	Post-	25	4.20	3.00	3.08	1.48	2.68	1.12	15.56
2.	Pre-	20	0.80	2.25	1.65	2.50	3.85	0.45	11.80
	Post-	20	3.45	9.45	3.90	0.75	1.25	1.00	16.80
3.	Pre-	7	1.57	1.71	1.86	1.71	2.28	1.28	10.43
	Post-	7	3.00	2.71	1.86	2.43	2.57	0.71	13.28
4.	Pre-	6	1.17	1.50	2.67	4.33	3.17	1.33	14.17
	Post-	6	6.83	0.33	0.33	3.50	6.23	0.33	17.67
5.	Pre-	21	2.10	1.52	4.38	3.76	3.85	2.76	20.57
	Post-	21	3.91	4.33	4.24	3.38	4.57	1.95	21.10
6.	Pre-	22	3.45	5.05	3.68	3.23	2.55	1.45	19.36
	Post-	22	5.59	4.41	2.73	1.86	2.64	1.09	18.27
7.	Pre-	18	1.67	3.17	3.89	4.17	4.83	2.50	20.22
	Post-	18	5.22	4.39	6.00	7.39	4.78	3.50	31.28
8.	Pre-	15	3.93	6.33	6.53	5.13	5.73	3.80	31.67
	Post-	15	4.27	3.93	4.67	5.07	7.00	3.40	30.33
All	Pre-	134	2.00	3.19	3.44	3.56	3.93	1.63	17.84
groups	Post-	134	4.47	4.34	3.71	3.07	3.48	1.74	20.81

shapes, by the eight village groups of subjects, in the pre-treatment and post-treatment sessions, have been shown in Table VI.

Perusal of the mean values for choices of shapes shown in Table VI again points to the remarkable stability of choice pattern across the pre-treatment and post-treatment sessions. The extent of stability is brought out more interestingly by computing the rank-difference coefficients of correlation between the means of six colours, for the two sessions, and for the six shapes, also for the two sessions. These correlation coefficients have been shown in Table VII.

The coefficient of correlation between total number of pieces chosen in the pre-treatment and post-treatment sessions is as high as .90. It will be noted that for most groups the coefficients of correlation are low, negative or positive, for choice of colours: which is in conformity with the significant colour-group interaction found by the analysis of variance for the post-treatment session. The coefficient of correlations between the two sessions for the choice of shapes is quite high for most groups.

The point that can be made is that the choice of pieces, for constructing the mosaic design, is not a purely random process – at least not for shapes. Some cognitive factors appear to be operating to produce this stability of choice pattern.

That there is a lot of individual variation in the choice of colours, and of shapes, in constructing the mosaic designs is quite clear. However, the question that is germane is: 'Is there any specific trend discernible in the ways that women of particular villages have picked up certain colours, and shapes, to make their mosaic designs?' Again, more importantly, 'Has any such trend been maintained, from the pre-training session to post-training session, among the 8 village groups?' Since there are six colours, and six shapes, giving a total of 36 separate colour-shape combinations from which pieces could be chosen to construct the design, there being complete freedom to choose as many pieces (up to a maximum of 10 from any one colour-shape combination) as one desires, the answers to the two questions posed above may be sought by an analysis of variance of the 'mixed-factorial' type, viz., Type VI of Lindquist (Lindquist, 1953, p. 292-297). The essence of the Lindquist Type VI design has been stated thus:

It is possible to administer all conformities of two of the factors to the same subjects, an experiment with three factors may be designed so that subject



TABLE VI: Means of the number of pieces chosen in six different shapes by the subjects of the eight different villages, for constructing the mosaic designs, in the pre-training and post-training sessions

village identifi- cation no.	Session		Shapes						
		N	Rectangle	Square	Rhombus	Equilater- al triangle	Isosceles triangle	Cross	All shapes
1.	Pre-	25	3.44	1.76	1.76	1.80	0.32	2.92	12.00
	Post-	25	1.96	4.92	4.00	1.16	0.28	3.24	15.56
2.	Pre-	20	3.05	4.55	2.30	0.50	0.00	1.40	11.80
	Post-	20	2.90	4.40	1.85	3.55	0.90	3.20	16.80
3.	Pre-	7	3.86	1.00	2.86	1.43	0.86	0.71	10.43
	Post-	7	3.00	1.00	2.43	1.86	0.29	4.57	13.29
4.	Pre-	6	0.83	4.33	7.00	0.17	1.00	0.83	14.17
	Post-	6	0.50	7.00	5.50	2.33	1.67	0.67	17.67
5.	Pre-	21	3.38	2.05	2.52	2.81	2.38	7.43	20.57
	Post-	21	5.05	2.00	4.29	2.24	1.33	6.19	21.09
6.	Pre-	22	4.86	4.18	5.09	1.05	0.77	3.41	19.36
	Post-	22	2.73	2.82	5.86	2.00	1.09	3.82	18.32
7.	Pre-	18	3.56	3.94	5.56	2.44	1.72	3.00	20.22
	Post-	18	7.94	4.94	10.94	2.22	0.78	4.44	31.28
8.	Pre-	15	4.33	1.47	7.87	3.60	2.93	11.47	31.67
	Post-	15	4.53	6.13	8.07	1.73	2.87	7.00	30.33
All groups	Pre-	134	3.64	2.95	3.99	1.82	1.21	4.24	17.84
	Post-	134	3.80	4.07	5.40	2.12	1.09	4.33	20.81

TABLE VII: Rank difference coefficients of correlation between pre-treatment and post-treatment means for six colours and for six shapes, chosen by the eight village groups

Village identification no.	Rank difference for six colours	Coefficient of correlation for six shapes
1	.09	.07
2	-.09	.49
3	.10	.14
4	.11	.59
5	.14	.89
6	.77	.77
7	.37	.94
8	-.09	.54
All villages	-.37	.89

differences are controlled in all effects except the main effect of one factor (c). (Lindquist, 1953, p. 292.)

The results of the analysis of variance of the choice of pieces in the pre-training session are shown in Table VIII, in which the following symbols are used:

C = Village group of women of subjects

A = Colours

B = Shapes

AB, AC, BC are the first-order interactions

AB = Interaction between colour and shape

AC = Interaction between colour and group

BC = Interaction between shape and group

ABC = Second-order interaction between colour, shape and group

It will be noted that the two main effects, 'between subjects' and 'between groups', are statistically significant, confirming the presence of considerable individual variation as well as variation among the eight different village groups.

Now, within the subjects, both 'choice of shapes' and 'choice of colours' are found to be significant beyond .01 level. But only one interaction, that between 'shapes and groups' is found to be significant beyond .01 level, the remaining two interactions, viz., 'between colours and groups' and 'between colours, shapes and groups' being non-significant.



TABLE VIII: Analysis of variance of choice of colours, shapes, and colour-shape combinations of mosaic pieces for constructing designs by subjects of different villages during the pre-training session

Source of variation	Sum of squares	df	Mean squares	F	P
S = Between subjects	822.60	133	6.19	3.31	.01
C = Between groups	143.74	7	20.53	3.81	.01
Error (b)	678.86	126	5.39		
Within subjects	8752.31	4690	1.87	1	ns
A = Between colours	90.74	5	18.15	10.68	.01
B = Between shapes	167.70	5	33.34	10.65	.01
First-order Interactions:					
AB = Colour $\times$ shape	41.44	25	1.66	1.02	ns
AC = Colour $\times$ group	58.21	35	1.66	1	ns
BC = Shape $\times$ group	286.66	35	8.19	2.60	.01
Second-order interactions:					
ABC=Colour $\times$ shape $\times$ group	213.59	175	1.22	1	ns
Error (w)	8682.46	4585	1.89		
Error <sub>1</sub> (w)*	1112.36	655	1.70		
Error <sub>2</sub> (w)**	2063.79	655	3.15		
Error <sub>3</sub> (w)***	5506.31	3275	1.62		
Total	9634.91	4823			

\* For calculating F ratio for A and AC.

\*\* For calculating F ratio for B and BC.

\*\*\* For calculating F ratio for AB and ABC.

We shall now study the results of the analysis of variance of the choices of pieces during post-training session shown in Table IX. Examination of the results of the analysis of variance shown in this table reveals a few interesting features. First, the 'between subjects' variation has dwindled to such an extent as to become statistically non-significant, though the variation between the 8 village groups remains statistically significant. But one important change in the post-training session is this: the interaction 'between colour and group' has become significant which was not so with the pre-training session choices. Again, the interaction 'between shapes and groups', which was significant in the pre-training session, has become non-significant in the post-training session. The cognitive structuring appears to have changed in such a way that choice of colour is no longer random, but shows some systematic trend, and choice of shapes has become more

TABLE IX: Analysis of variance of choice of colours, shapes, and colour-shape combinations of mosaic pieces for constructing designs by subjects of different villages during the post-training session

Source of variation	Sum of squares	df	Mean square	F	P
S = Between subjects	684.17	133	5.14	1.12	ns
C = Between groups	114.54	7	16.36	3.56	.01
Error (b)	569.63	126	4.60		
Within subjects	16220.73	4690	3.46	1.00	ns
A = Between colours	83.60	5	16.72	6.85	.01
B = Between shapes	286.30	5	57.26	8.73	.01
First-order interactions:					
AB = Colour $\times$ shape	111.10	25	4.44	1.49	ns
AC = Colour $\times$ group	199.67	35	5.59	2.29	.01
BC = Shape $\times$ group	271.52	35	7.79	1.19	ns
Second-order Interaction:					
ABC = Colour $\times$ shape $\times$ group	402.59	175	2.30	1	ns
Error (w)	15662.92	4585	3.42		
Error <sub>1</sub> (w)*	1597.34	655	2.44		
Error <sub>2</sub> (w)**	4297.31	655	6.56		
Error <sub>3</sub> (w)***	9768.28	3275	2.98		

\* For calculating F ratio for A and AC.

\*\* For calculating F ratio for B and BC.

\*\*\* For calculating F ratio for AB and ABC.

random. Diminished variability from group to group in terms of choice of shapes, and increased variability in terms of choice of colours, have undoubted cognitive developmental implications, the exact psychological meaning of which has to await further investigation.

### Comparison with Other Groups

It will be interesting to have an idea as to how the illiterate or semi-literate adult women of Andhra Pradesh villages of the present study, during pre-training and post-training sessions, compare with other groups in their mosaic performance in terms of choice of total number of pieces.

The study conducted by Chatterjee (1971) is based upon data on mosaic designs constructed by 66 children belonging to grades I to VI, from five schools which varied widely in terms of what may be called



'quality of level of schooling'. Two were modern convent type of schools from the cities of Varanasi and Patna; one was from the rural area of Varanasi, but was otherwise well equipped; and the remaining two schools were from rather backward and inaccessible areas of Varanasi and Mirzapur districts. In the other more recent study carried out by Chatterjee *et al.*, called the 'Developmental Norms of children of  $5\frac{1}{2}$  to  $11\frac{1}{2}$  years', the sample consisted of 301 children drawn from 15 schools of the city of Varanasi, and 300 children drawn from 16 schools located in the rural area of Varanasi district. The children in the sample belonged to grades I, II and V, and their age ranged from  $5\frac{1}{2}$  to  $7\frac{1}{2}$ , and  $11\frac{1}{2}$  to  $12\frac{1}{2}$  years. In the earlier study the age range of the sample was 8 to 14 years.

The mean numbers of pieces (of all colour  $\times$  shape combinations) chosen by the different groups of children in the three separate studies have been shown in Table X.

An examination of means of total number of pieces used by different groups shows that the adult illiterate women, in general, chose a smaller number of pieces than even children of the earlier grades in primary schools. But there was all-round gain in the post-training session in all groups (except the MCC group) so much that the mean of the composite MCC+FLIT group rose to 30.85 pieces, which was slightly higher than that for grade II children in the DNP study. As we do not conclude that this increase in the mean number of pieces used can be attributed to some sort of growth in cognitive functioning, this may be due to familiarity and practice with the test-taking situation, generation of self-confidence and feeling more at ease. Only further experimentation can establish if change in cognitive functioning is involved in the process under study.

### Qualitative Aspects of Mosaic Designs

It has been mentioned earlier that all the mosaic designs were rated, with the help of three rating scales, for obtaining a quantitative measure of the presence or absence of certain qualities in these designs. The ratings were done by three judges for the pre-training session protocols, and four judges, including the previous three, for the post-training session protocols. The mean ratings obtained by the mosaics from the four different experimental groups, in the three sub-scales and the full scale, for both pre-training and post-training sessions, have been shown in Table XI. To facilitate

TABLE X: Means of total number of pieces chosen to construct mosaic designs by subjects belonging to different groups in three different studies

Group	Educ. standard grades	Age range Yrs	Mean number of pieces chosen					
			Male		Female		M+F	
			N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1. School children of U.P.	I-VI	8-14	49	—	17	—	66	25.04
2. School children (DNP study of U.P.)	I	5½-6½	61	27.77	35	26.52	96	27.68
(a) Rural	II	6½-7½	66	28.66	26	29.34	92	28.85
(b) Urban	V	11½-12½	83	32.93	31	33.32	114	33.03
	I	5½-6½	66	28.53	42	29.09	108	28.75
	II	6½-7½	57	29.38	39	30.45	96	29.81
	V	11½-12½	65	34.57	32	34.37	97	34.54
3. Adult women of Andhra Pradesh	Illiterate	Adults						
		(18-45)						
(a) Pre-training	i. Control				43	12.33		
	ii. FLIT				14	11.93		
	iii. MCC				43	20.21		
	iv. MCC+FLIT				33	25.27		
(b) Post-training	i. Control				43	17.84		
	ii. FLIT				14	15.79		
	iii. MCC				43	19.67		
	iv. MCC + FLIT				33	30.85		



TABLE XI: Means of ratings in three sub-scales, and the full scale for measuring artistic qualities of mosaic designs constructed by different groups of subjects

Group	N	P-scale		A-scale		M-scale		Full scale	
		Pre-	Post- Gain	Pre-	Post- Gain	Pre-	Post- Gain	Pre-	Post- Gain
1. Andhra Pradesh study									
(a) Control	42	10.80	11.52 0.72	10.30	10.82 0.52	4.98	5.39 0.41	26.09	27.93 1.84
(b) FLIT	14	11.14	12.07 0.93	10.96	11.30 0.34	4.81	5.71 0.91	26.81	29.09 2.28
(c) MCC	43	11.34	12.12 0.78	11.08	11.55 0.37	5.03	5.73 0.70	27.65	29.38 1.73
(d) MCC+FLIT	32	11.92	12.75 0.83	11.39	12.35 0.96	5.48	5.92 0.44	28.76	31.02 2.26
Control	42	10.80	11.52 0.72	10.30	10.82 0.52	4.98	5.39 0.41	26.09	27.93 1.84
Experimental	89	11.61	12.34 0.73	11.16	11.81 0.65	5.15	5.80 0.65	27.92	29.93 2.01
All groups	131	11.37	12.08 0.71	10.88	11.48 0.60	5.09	5.73 0.64	27.33	29.29 1.96
2. East-U.P. children's study									
(a) Urban	24							28.47	
(b) Rural	42							25.17	
All groups	66							26.94	
3. DNP study Varanasi Distt.									
Urban children									
(a) Grade I	108	11.96		10.93		5.93		28.75	
(b) Grade II	96	12.28		11.57		5.98		29.81	
(c) Grade V	97	14.24		13.87		6.53		34.54	
All 3 grades	301	12.80		12.08		6.07		30.95	
Rural children									
(a) Grade I	96	11.55		10.42		5.71		27.68	
(b) Grade II	92	12.09		10.92		5.78		28.85	
(c) Grade V	114	13.61		13.02		6.39		33.03	
All 3 grades	302	12.49		11.55		5.99		30.06	
All children	603	12.64		11.82		6.03		30.35	

comparison, the mean ratings obtained by the mosaics constructed by the subjects of the previous two studies referred to earlier, have also been shown in the lower part of the same table.

The large number of means shown in Table XI have to be considered into two parts: First, we may confine ourselves to the means of the ratings given to the mosaics constructed by the adult women of Andhra Pradesh. We note, at once that all the groups, including the control group, have made gains in the subjective quality of their designs in the post-training session over their pre-training session performance. This holds for all the three sub-scale means, as well as the full-scale means. However, it appears that the maximum gain has been made by the FLIT group (only literacy training), closely followed by the FLIT+MCC group (literacy plus maternity and child care training). Next comes the control group, and the smallest gain is made by the MCC group (only maternity and child care training), while the mean for the control group is 1.84 points, the same for the three experimental treatment groups combined comes to 2.01 points. The result of a *t*-test done to test the statistical significance between the pre-treatment and post-treatment means is quite interesting. For the control group the value of *t* is 1.804, which with 40 df. fails to reach statistical significance. But for the three experimental groups together, the value of *t* is 2.86, which, with 87 df. is significant beyond .01 level. (The *t*-values are for unmatched groups; in fact, due to inevitable positive correlation between pre-training and post-training ratings, given to mosaics coming from the same subjects, both the *t*-values are likely to be somewhat higher than reported above.) Hence, it is clear that the experimental groups, specially those having the advantage of training in literacy, significantly raised the aesthetic quality of their mosaic designs, as reflected by the ratings given to them.

Comparing the same means with those given to mosaics constructed by children of primary classes, we note that the overall artistic or aesthetic level of mosaics constructed by the adult women of Andhra Pradesh villages is slightly higher than that of school children of grade II, but lower than that of grade V. Most probably the level will be equal to that of grade III and grade IV. The systematic increase in mean full scale score from 28.75 to 34.54 for urban children, and from 27.68 to 33.03 for rural children, going from grade I to grade V, is undoubtedly linked up with cognitive growth. To that extent, the mean rating score of 27.93 and 29.29, for the entire



sample of Andhra women subjects of the present study, can be taken as a rough and ready index of their level of cognitive development.

### **Implications of Findings**

It seems that training of one sort or another, be it literacy, mother and child care, or literacy combined with mother and child care, exercises some sort of impact upon the women undergoing training, in specific and consistent ways. First, there is a tendency towards greater expansiveness, a move away from restrictiveness, expressed through the process of making the mosaic designs. After training, the trained groups appear to be taking more time, using more pieces, using more sub-designs, and using more space available, while fabricating the designs chosen by them. Second, the magnitude of variability in performance which characterises pre-training performance is decreased to some extent, in general, after undergoing the training experience. The training, in this way, appears to be exercising a homogenising effect upon the experimental groups. On the other hand, in the control group, the variability has increased in all the four measures considered here. This compares with 6 instances of increase in variability, and 6 instances of decrease in variability in the three experimental groups, for the same 4 measures. The conclusion seems to be in order that the treatment undergone by the women of the three experimental groups seems to find some expression in the way the subjects have chosen the plastic pieces to fashion designs on the tray – which, in the final analysis, are cognitive functions. And the overall trend is towards expansion and extension – which is akin to a process of loosening of constraints in the psychomotor processes involved in the test-taking behaviour.

The above conclusions follow from the comparisons of some rather gross measures of a few purely objective features of the test output, and test performance, in the pre-treatment and post-treatment sessions. The analysis can be pushed a little deeper by focusing more sharply on purer cognitive dimensions of the choice process that underlies construction of mosaic designs. In other words, attention is focused on preference for particular colour or colours, out of the six colours available; on preference of certain shape or shapes out of the six shapes available; and on preference of certain colour-shape combinations out of 36 different combinations available. The results of the analysis of variance of choices of colours, shapes, and their

combinations, in pieces picked up for constructing the mosaic designs by subjects belonging to different villages throws some light on this aspect of their cognitive functioning. The analysis of variance results indicate that there is no particular preference ordering for choosing colour-shape combinations in the pre-treatment or post-treatment sessions. But there is certainly considerable variability with regard to choice of colours, and choice of shapes in both sessions. And one interesting finding may have some implication for cognitive psychology. In the pre-treatment session, the interaction between shape and group is statistically significant, but it is not so in the post-treatment session. Again, in the pre-treatment session, the interaction between colour and group is not significant, but becomes so in the post-treatment session. This means that in the pre-treatment session certain groups have preferred certain shapes in particular ways, but this systematic, group-specific trend has not been maintained in the post-treatment session. Again, in the pre-treatment session, choice of colours was not group-specific, but in the post-treatment session it becomes so, as some groups have chosen certain colours in certain ways. Why this should be so? Is it related to the effect of training? This calls for further exploration with increased precision.

The homogenising effect of training, by reducing variability within groups, appears to be confirmed by the above results. While in the pre-treatment session, the 'between subjects' main effect is significant at .01 level, it is reduced so as to become non-significant in the post-treatment session.

### **Artistic Quality of the Mosaics**

The results of the analysis of the artistic qualities of the mosaic designs also point to an improvement, resulting from training. It is noteworthy that in the matter of artistic quality of the mosaics, both the control and the three experimental groups make gain in the post-treatment session. But whereas the magnitude of gain in the control group may have been too small to reach the level of statistical significance, the magnitude of gain made by the three experimental groups taken together is certainly big enough to reach statistical significance.

The artistic or aesthetic level of the mosaic designs constructed by the subjects of the present study, who were illiterate or near-literate adult women of Andhra Pradesh villages, was similar to that of grade



I children of eastern Uttar Pradesh. It appears that the average level of artistic quality registered a rise, following the training, to a level similar to that of grade II children, or slightly higher. We may not be far off from the truth to conclude that one incidental benefit of the training appears to be cognitive growth in these women subjects, the magnitude of which is approximately equal to that taking place in about 1 to 1½ years of normal schooling in primary schools, in the earliest grades.

The results of the present study seem to indicate that the mosaic test shows good promise for indexing changes in cognitive functioning that may be concomitant outcomes of non-formal training of adult learners. A follow-up after several years may reveal some further interesting trends in the sphere of cognitive functioning.

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## PARTICIPANTS, NON-PARTICIPANTS AND DROP-OUTS

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Concepts and Definitions: Methodology; Field Operations; Content Analysis of Data — Factors for Non-Participation: Lack of Leisure; Family Resistance; Low Level of Motivation; Absence of Material Incentives; Wrong Choice of Methods; Irrational Beliefs; Programme Incredibility; Rigidity of Regulations; Wrong Location — Factors influencing Dropping Out: Occupational Involvement; Migration; Fear of Sterilisation; Family Opposition; Official Pressure; Allergy to Adult Education; Operational Rigidity; Fear Complex; Caste Phobia; Sickness in the Family — Factors for Participation: Family Cooperation; Family Background; Awareness of Deprivation; Ability to take Risks; Material Incentives; Teacher Appeal.

### *Abstract*

This chapter presents a study of the factors behind participation, non-participation and dropping out in respect of the non-formal education programme. The study was carried out during the Phase II Resurvey period.

OUT OF A total sample designed for 480 respondents in the three action villages, only 361 pregnant, lactating and weaning women could be interviewed for the Bench Mark Survey of Phase II in the FLIT, MCC and MCC+FLIT programme villages. Thus, among those who were randomly selected at the time of the Bench Mark Survey, only about 75 per cent expressed their willingness to participate in the action programme. When the action programme actually started an additional 16 (or 4 per cent of the surveyed) respondents refused to participate. Ninety (25 per cent) women attended the programme for some time and then discontinued. Only 255 (71.0 per cent) women participated in more than 25 per cent of the non-formal education programme classes.

The functional literacy treatment had the largest proportion of drop-outs and of those who refused to participate from the beginning.



Only 16 (24.6 per cent) women participated in at least 25 per cent of the classes till the end.

### Concepts and Definitions

In this study, the term *participant* refers to those women who agreed to participate in the experimental manipulation (i.e., attending non-formal or functional literacy classes) at the time of Bench Mark Survey and participated in at least 25 per cent of the classes within the duration of the project. The *non-participants* are those, who agreed to participate during the Bench Mark Survey but refused to participate when the action programme started. The *drop-outs* are those who participated in the action programme for some time and did not attend even 25 per cent of the classes.

*Methodology:* It was thought that the questionnaire type of survey will not be of much use to make an intensive study of the perceptions, attitudes and motivations of these three categories of potential participant women. In a structured interview, the respondent and the interviewer find themselves constrained because of predetermined response categories and questions. Because of the flexibility of the depth interview, the respondents may feel free to express their own thoughts even though the direction of the interview is clearly in the hands of the interviewers. Hence, it was decided to use a semi-structured interview situation for exploring the factors for participation, non-participation and dropping out. A few leading questions related to participation, non-participation and dropping out were prepared. Depending on the replies of the respondent, supplementary questions were put to probe into the underlying meaning and direction of the answers.

Since our major concern was the literacy treatment (as there was a high degree of non-participation) it was decided to study all the four villages in that treatment. In order to obtain a comparative picture of the factors for the levels of participation between the service villages (MCC and MCC+FLIT) and non-service (FLIT) villages, it was decided to study two MCC and two MCC+FLIT programme villages where the participation levels were very low.

Data for the present study were collected during the Phase II post-survey period. One female investigator with a Master's degree in social anthropology was specially recruited to interview the women. On the first two days the investigator received intensive training in the field. A

schedule was prepared. Model interviews were conducted in the field. The interviews were tape-recorded. The method of recording the case studies was demonstrated.

On the second day, the interview was closely observed and some of the mistakes were pointed out. In the first village both the investigator and the Project Officer conducted the interviews. Major emphasis was laid on establishing a high degree of rapport. The respondent was given a greater degree of freedom to express her ideas. The interviewer had to give only the cue, and wherever necessary she was asked to probe into the real meaning of the respondent's statement. During the interview, the points were noted down and after each interview the case history was recorded.

*Field Operations:* The interviewer stayed for two days in each literacy village. Although the action programme was over, the concerned literacy teacher accompanied the interviewer during the course of the interview. Since the literacy teacher had lived for about a year in that village, problems relating to food, accommodation and rapport were minimal.

In the service villages, where the Health Educators were not available for assisting the investigator, it was decided to use one more investigator, who had a Master's degree in anthropology. With a brief field training, the second interviewer was able to carry on interviews independently. The team used to leave the field headquarters at 5:00 a.m. and reach the village before 6:00 a.m. and return to the headquarters after completing the interviews in the village. Both the interviewers could complete one village in a day and could conduct about 25 to 30 depth interviews. In total, 212 respondents were interviewed, of which 114 were from the functional literacy villages and 98 from the service villages.

*Content Analysis of Data:* The interviews which were also tape-recorded were analysed by listening to the tape-recordings and noting the frequency with which factors were mentioned and also some qualitative appraisal was made of the relative importance of factors. The results of these analyses in respect of the non-participants, the drop-outs and the participants are presented in this chapter.

### **Factors for Non-Participation**

*Lack of Leisure:* Lack of leisure due to the home management as well



as their participation in the farm and non-farm work and migration emerged as the most important factor for non-participation in the literacy programme.

The non-participants said that they had to get up before sunrise, clean the house, courtyard, utensils, bring water from a distant well, prepare *roti* and *ambali*, serve the family members, attend to the needs of the children and immediately leave for farm work or non-farm work, which was the source of their livelihood. When they returned home after sunset, they had to cook dinner for the family, serve the family members and attend to the needs of their young children. By the time they completed their daily routine, they said that it was time to go to bed so as to get up early next morning.

A non-participant said that only people without any work could go to the centre. A washer woman said that she washes the clothes for all the villagers. Consequently, she had to go round the village to get food from all the houses. The potter woman assists in the pottery work. The *Ediga* (toddy tapper) woman assists her husband in selling arrack. The basket weaver's wife assists her husband in weaving. The shepherd woman does sheep rearing and blanket weaving. One woman said that whenever the teacher visited her house it happened that she was not there.

Some of the non-participants were seasonal migrants. They used to go to the irrigation project areas in the neighbouring districts or States with their husbands for about 6-8 months in a year in order to earn their livelihood and support the older members of the family.

Most of the non-participants belonged to nuclear families and there was no one else to help them in their daily work and look after their children. One of the literacy non-participants said: 'I have a large family. They won't leave me. If I start going to the centre, all the children would follow me.' Another literacy non-participant explained: 'Although mine is a joint family, the co-sister has her own work to do.' A barbar woman mentioned that her mother-in-law will not do any work and so she had to do all the work. A *Dhobi* woman said that her in-laws were old and so she had to look after them. A woman from the MCC+FLIT programme village mentioned that if somebody were there to look after her young children, she would have attended the classes. Her young children will not leave her. The same woman said that because of labour-work, she could not attend the classes. She argued that if she had to go to the centre, who would cook and feed her husband? She along with her husband and son get unskilled work like digging earth, etc. She complained that she could take only three



days of rest when she delivered her baby.

Most women said that when they agreed to attend classes they were pregnant. At that time they thought they would be able to attend the classes. By the time the programme started, they had already delivered the babies. So, as lactating mothers they found it very difficult to attend the programme. Thus, lack of leisure due to their household chores and pre-occupations, migration, nuclear families having breast-fed children, were some of the important obstacles cited by the non-participants which stood in their way of participation.

*Family Resistance:* Resistance from husband, in-laws and other family members, due to unfavourable view of education for adult women, was another important factor cited by the non-participants. One respondent complained that when she expressed her desire to visit the centre, she was beaten up by her husband who would never send her out of the house. He did not like his wife talking to strangers. Many respondents mentioned that their husbands did not favour their participation in the educational classes. The typical attitude of these women and their husbands was that it was sufficient if the wives could cook and feed the family members and look after their children.

*Low Level of Motivation:* The low motivational level (aspiration) coupled with perceived non-utility of the educational programme in the context of their immediate surroundings was another important factor for non-participation. Most women mentioned that they were not interested in literacy or education. The typical replied received were: 'What is the use of getting education, and that too for women?' — 'There is no need to obtain education at this age (middle or old).' — 'Education is not necessary for *Golla* people. Their business is to tend sheep.' A washerman's wife who had lost her husband just before the introduction of the action programme said: 'Why should a woman get education after the death of her husband? Will I get remarried if I attend the education classes? After all, I am a *Dhobi*.'

Similar replies were given by women in the MCC and MCC+FLIT villages also. A Kurava (shepherd) woman said that they are the people who live in mud and are brought up in mud. Where is the necessity of education to such people? She won't get any job, if she attends the classes. Another woman said that unless one is educated up to the primary level, it is a sheer waste of time to attend the centre. Thus, the low motivational level coupled with the perceived non-utility of education is another factor for non-participation.



*Absence of Material Incentives:* Absence of material incentives in the form of medical services and nutritional supplements in the education programme of FLIT treatment was another factor mentioned by the non-participants. The replies of literacy non-participants are interesting. A *Boya* (earth worker) woman who was aware of the health and nutritional programmes in the service villages mentioned that if she gets *balahar* and salad oil and medicines for herself and children, she would attend the classes. If such facilities are extended to FLIT also, she would make all her community people to attend the programme. A washerwoman said that if she was given half a measure of rice every day, she would attend the classes. A Harijan woman said that if the government would pay her a hundred rupees, she would attend the centre regularly. A Madiga (Harijan) woman from a health programme village said that incentives are given for a limited period only. They will not be there in the future. So where was need to take them for a few days only?

*Wrong Choice of Methods:* Inadequate motivation and wrong choice of methods of motivation is another factor that resulted in non-participation. Some of the non-participants of literacy and service villages said that they were unaware of their names being included for participation. Either the husband or the in-laws had given their names and assured the motivating team that they will attend the classes. Some women mentioned that in spite of their refusal to participate, their names were recorded and data were gathered from them.

Some women reported that they agreed to participate because the motivating team seemed to have used pressure tactics without giving adequate explanation about the nature of the project. A *Kumhari* woman (potter's wife) said that *Sarkar* (government) people visited her house and asked her name and her child's name. She did not know that she would have to attend the centre. If she had known earlier, she would not have given her name. A *Madiga* (Harijan) woman mentioned that her name was taken long back and nobody has approached her since then. So, she kept quiet. Another woman mentioned that on the persuasion of the Sarpanch and teacher, she agreed to participate. Later she migrated to another village. A *Telaga* woman said that the village Sarpanch and Patel insisted that she should give her name. A *Kurva* woman said that on the first day the Sarpanch, Patel and the teacher compelled her to attend and the centre people had applied vermilion to everybody but did not give any money which was against the local custom. Another woman said that

her husband gave her name and wanted her to attend. But she was reluctant from the beginning. Another literacy non-participant said that although she was reluctant to participate, data were collected with the help of Kavalikar.<sup>1</sup>

*Irrational Beliefs:* Certain beliefs regarding the evil influence of education was another factor for non-participation. Only a couple of non-participants had shared this belief. An *Erukala* (basket weaver) woman mentioned that her family had a belief that the person who goes to school will die. It had happened in her family. A *Telaga* (backward community) woman from a health programme village also held the same belief. She said that her family has the belief that if anybody from their house attended school, somebody in the family would die. She reported that it did happen in her family. When her brother-in-law started going to school, her child died and when she gave her name to attend the centre, her brother-in-law died. Hence, they decided not to educate anybody in the family. In these villages there were a few people who had such irrational beliefs which were apparently deep-rooted.

*Programme Incredibility:* Lack of faith in the health programme and its association with sterilisation was a vital factor for non-participation in the service villages. Most women mentioned that the programme was intended to induce them to accept sterilisation. A *Kurava* woman said that her caste people had frightened her by saying that she would be taken to the government headquarters hospital and forcibly operated and thrown away somewhere. She admitted that if she had no fear of tubectomy, she would have participated. Another woman said that both her husband and mother-in-law refused to allow her to participate because of this fear and suspicion. A *Telaga* (backward caste) woman said that both she and her husband were inclined to attend. But she was scared of tubectomy. Her husband had also told her that it was good to listen to elderly persons who suspected that tubectomy would be carried out. One *Kurava* woman said that she didn't mind even if she had to undergo tubectomy but there was none to help her, if she fell sick. After her operation, she said that it would be difficult to do labour work. A *Reddi* (upper caste) woman argued as to why only her name was taken in the list, leaving out her co-sisters. They also gave their names but nobody contacted them for data collection. (She could not, obviously, understand the random sampling procedures.) This made her more suspicious. A washerwoman said that at first she thought that all women would



attend the centre, but she came to know that only some were selected. She suspected that something would happen to them. They would be tubectomised, and so she did not go to the centre. A *Kurava* woman said that she was the only person who had her name in the list among all *Kurava* people of her village.

Apparently people in the area are afraid of sterilisation. They feared that many devious means were being adopted to sterilise them. They saw the project as one such device and so they did not participate.

*Rigidity of Regulations:* The inevitable rules and regulations required to run a field experiment in a scientific way were reported to be a hindrance by a few. A shepherd woman said that when the centre had started she had been to her mother's place for about a month. When she came back she wanted to attend. But the teacher told her that they had removed her name. She said that if the teacher had given her a chance to attend, she would have attended the class. A *Kummari* (potter) woman said that she wanted to attend. But she fought with her husband and stayed in her mother's place and returned only after six months. Though her husband was against her participation, she was able to convince him. But the teacher refused to admit her again as she was absent for six months. Another woman said that she had migrated for about three months. Later she wanted to get medicines, *balahar* and salad oil from the centre. But the teacher told her that her name had been taken away from the list. There were a few people who were away from the village for an extended period and so they could not attend the classes. When they tried to attend the centre again they were not permitted to do so, as this was an experimental project. Some women gave this as a reason for non-participation.

*Wrong Location:* The locational factor such as the distance from residence to the centre was another factor often cited by the literacy non-participants. A few health programme non-participants have also mentioned this aspect. They said that it is difficult to walk down from one end to the other end of the village during the night to attend classes.

From a content analysis of the case studies, the following factors have been identified as causes for non-participation: (1) lack of leisure; (2) family resistance; (3) low motivation coupled with perceived non-utility of the programme; (4) absence of desired level of incentives; (5) inadequate motivation or wrong choice of motivational methods; (6) irrational beliefs; (7) programme incredibility; (8) regulations required



for a field programme; and (9) geographical distance.

### Factors Influencing Dropping Out

Before probing the drop-out category of respondents for the reasons of their dropping out, we asked them to mention the reasons for their initial participation before dropping out. A significant proportion of literacy drop-outs mentioned that since the teacher used to persuade them daily, they decided to participate. The major factor mentioned by the service programme drop-outs was the provision of incentives (*balahar*, salad oil and medicines). The other common factors cited by them were: (1) they had leisure to attend during summer; (2) spouse, in-laws and other family members encouraged them; (3) they were interested to learn because of the spouse's social standing and education; (4) the centre was near; and (5) their caste women were attending.

When they were probed for the reasons of their dropping out, the following factors emerged: (1) lack of leisure due to occupational involvement and family management; (2) incredibility or lack of faith in the health programme; (3) resistance from spouse, in-laws and other family members; (4) low motivation to obtain knowledge; (5) traditional values and beliefs; (6) unfavourable community norms for women's adult education; (7) operational rigidity in programme operation; and (8) physical distance or locational factors. The detailed responses are analysed below:

*Occupational Involvement:* As in the case of non-participants an overwhelming majority of drop-outs mentioned that lack of leisure due to their occupational involvement and home management resulted in their dropping out. The respondents said that since the action programme was started in summer, they could find time to attend the classes. But during the rainy season they became very busy and so decided to drop out. A *Boya* drop-out from a literacy centre mentioned that she attended the centre since she had no work in summer. In the rainy season she had to go for labour work and farm work. When she attended, her husband scolded her for neglecting the household work. Even her father-in-law objected. A *Madiga* (Harijan) woman from a health programme village said that she could attend the centre only in summer. In summer there is no work. In the rainy season she had to go for farm labour such as sowing, transplanting, harvesting, earth work, etc. So, she said that she could not afford to



attend the centre.

Many women mentioned their pregnancy status as one of the important factors for participation and dropping out. They mentioned that they were able to attend the centre during the last trimester of pregnancy because they had adequate leisure. After delivery and during lactation they could not find time to participate. A *Musti* woman from a literacy village said that when the centre started, she was pregnant. So she attended. When she delivered, she could not leave her young child. A *Golla* (shepherd) woman said that after her delivery, her husband and in-laws did not allow her to go to the centre. A *Madiga* (Harijan) woman said that after her delivery, when she wanted to go, her husband objected. Another *Madiga* woman of a health programme village said that she was attending the centre even though she was pregnant. Later she gave birth to a baby. She could not attend for a few days. Again she started attending. But, she stopped because of farm work, labour work and household work.

*Migration:* Migration was another factor mentioned by the drop-outs of both literacy and service programme villages. A *Golla* (shepherd) woman from a literacy village said that they leave the village for 8 months in a year. An *Ediga* (toddy-tapper) woman mentioned that she attended the centre for about ten days because she used to complete her work earlier and go to the centre. Later her husband and son migrated for about 5 months. During that time she had to take care of children and all household work, so she stopped. A *Madiga* (Harijan) woman from a health programme village attended the centre for 4 or 5 days. Later she stopped going. She had been to another village for mud work and returned after 6 months.

*Fear of Sterilisation:* Incredibility or lack of faith in the health programme was cited as a major factor for drop-out. They were quite apprehensive about sterilisations. A *Telaga* (backward caste) woman said that her neighbours and community people frightened her, saying that the centre people would take her in a jeep and admit her in the city hospital and carry out tubectomy. As she was frightened of tubectomy, she stopped going to the centre. Her co-sisters also dropped out. Another *Telaga* (backward caste) woman said that her neighbours stopped going to the centre because a rumour had been spreading in the village that people who attend the centre will be taken to another place and dropped down from a height if they did not agree to be tubectomised. So, she too stopped going to the centre.

A third *Telaga* (backward caste) woman said that a rumour had

been spreading in her area that the people who go to the centre would be killed by the doctors. So, she stopped going to the centre. After some time she fell sick and her child also got fever. Her child could not be cured even after 10 days with the medicines provided by the centre. Then, she went to Mahbubnagar Hospital, spent Rs.25 and soon it was cured. So, the family elders started telling her that the medicines given at the centre were not that good and the people in charge of the centre did not know the correct medicine for a disease. So, they told her it is no good taking medicines from the centre or attending the centre. After listening to them she too stopped attending. Apparently there were many wild rumours about the bona fides of the project and many people believed such rumours.

*Family Opposition:* Resistance from the spouse, in-laws and other family members has been cited as one of the major reasons for dropping out. A couple of respondents from the literacy and health programme villages mentioned that they attended the centre for some days without the knowledge of their husbands. When the husbands resisted, they stopped attending. A *Reddi* (upper caste) woman said that she did not go for farm work but her mother-in-law did. When she returned the respondent had to help her and serve her. One day the respondent was not at home when she returned from the fields. So, she got angry and asked the respondent not to attend the classes. A *Telaga* (backward caste) woman who dropped out on the third day said that her mother-in-law and sister-in-law prepared the food on the days she attended the centre and looked after her children. But after three days they quarrelled with her and refused to cook at night or look after her children. Her mother-in-law and husband asked her to drop out.

*Official Pressure:* The low motivational level of the respondents to participate in the educational programme was another factor for dropping out in both literacy and service programme villages. A literacy respondent said that although she was not willing to attend the centre, the teacher used to visit her house daily. So, her in-laws requested her to attend the centre at least once. Another woman said that due to the pressure from the Sarpanch and Patel, she attended for a month. A *Mangali* (barber) woman said that she was willing to attend, as the teacher used to tell her daily that it would be useful if she gets education. So she attended for ten days. All these women were not really motivated to attend. When requested by others, they attended for a few days and then dropped out.



*Allergy to Adult Education:* Negative community norms on women's adult education was another factor for drop-out. A *Reddi* (upper caste) woman of a health programme village said that she attended for one month and then she went to her mother's place and visited her relatives. After her return she dropped out because all her relatives criticised her. A *Madiga* woman mentioned that her children made fun of her saying that there was no need for education in old age.

*Operational Rigidity:* Operational rigidity in the programme administration was another factor for drop-outs in the health centres. An *Ediga* (toddy-tapper) woman said that she used to take her children to the centre. The teacher told her not to bring children with her. So she stopped going to the centre. A *Kummari* (potter) respondent said that her mother-in-law objected because she had to return home very late. She requested the teacher to permit her to leave early but the teacher made her stay for the entire duration of class. So, her husband and mother-in-law quarrelled with her. She stopped attending for some days. When her child was ill, she went to the centre to get medicines but the teacher told her that they had struck off her name from the list. A *Telaga* woman said that she attended the centre for 4 or 5 days. Later she migrated for five months. After her return when she wanted to attend classes, the teacher refused admission.

*Fear Complex:* Irrational beliefs figured as another factor for dropping out. A *Golla* (shepherd) woman said that one day when she was returning home, she got scared and frightened. She had fever and suffered for 10 days. Her husband persuaded her to attend but she did not want to continue. An *Aousala* (goldsmith) woman said that since *Mala* and *Madiga* (Harijan) people, who were attending the centre, were not clean, her child got fever and suffered for 15 days. So her mother-in-law refused to send her to the centre. An *Ediga* (toddy-tapper) woman said that her mother-in-law refused to send her on the first day itself. But she attended. At the centre they weighed her and her child on the machine (at the Bench Mark Survey) which she had never seen before and they took her measurements. By seeing all these, she was frightened and informed her family members. Her husband got frightened after listening to her. So the family members refused to send her when the teacher approached them.

A washerwoman felt that her child got fever because she used to attend the classes. The teacher gave medicines but it did not cure her. So she dropped out. A *Kurava* woman attended for two months and



stopped because she became pregnant. Her husband and neighbours asked her not to attend because they said that there might be evil spirits on the way to the centre in the darkness.

*Caste Phobia:* The location of the centre was another factor mentioned by those dropping out. A *Madiga* (Harijan) woman from a literacy village mentioned that she could not attend when the centre was shifted to Patwari's (Brahmin) house. She used to serve the family. She felt that she was not expected even to stand before them. How can she attend classes in their building? The same advice was given by her husband and the elders. So she stopped attending. Apparently locating the centre in a ritually pure person's house prevented a few lower caste women from attending classes.

Physical distance of the centre was another factor mentioned by the drop-outs. Many drop-outs mentioned that because the centre was far away from their residence, it was difficult to return home unescorted. Hence, they decided to drop out. A *Madiga* woman from a literacy centre said that in the beginning the centre was near her house. Later it was shifted to another place far away from her house. She therefore stopped attending the classes.

*Sickness in the Family:* Family sickness or crisis situation in the family was mentioned as a factor for dropping out. A *Kurava* woman said that she attended the centre for eight days. Then she stopped going due to the ill-health of her three-year old son. A *Mangali* (barber) woman said that she used to attend the centre because her husband was doing a job. But, soon he lost his job. So, she started going for labour work.

Thus, lack of leisure, programme incredibility, operational rigidity in the execution of the programme, irrational beliefs, geographical distance and family sickness were some of the factors for dropping out. Although the reasons for non-participation and dropping out are similar, the drop-outs did not mention the inadequacy of incentives and sensitisation. Family sickness was reported as a factor for dropping out.

### Factors for Participation

*High Motivation:* Most women who participated indicated a high level of motivation to attend the educational programme and learn. A *Golla* (shepherd) literacy participant said that her husband refused to send her in the beginning. She had to attend to the farm as well as the



non-farm work. She used to complete all her household work quickly and attend the centre because she wanted to gain knowledge and educate herself.

A *Balja* (backward caste) woman said that she attended the centre with the idea of obtaining knowledge. She argued that she wouldn't get anything if she simply stayed at home. A *Madiga* (Harijan) health programme participant said that she wanted to learn whatever they taught at the centre. An *Ediga* (toddy-tapper) woman mentioned that her husband and mother-in-law opposed her participation for fear of family planning. But she was interested in attending and it was possible for her to attend regularly. A *Reddi* (upper caste) woman said that in spite of her farm and home-work she could find time to attend the centre because she was interested to learn. She said that even if no incentives were given, she would have attended.

*Family Cooperation:* An overwhelming majority of respondents mentioned that they received encouragement and cooperation from their family members. A literacy participant said that since her husband was at home, it was possible for her to attend the centre leaving her young child with her husband. Another participant said that since her mother-in-law was at home to help her, it was possible to attend the centre. A *Kummari* woman said that her two daughters-in-law used to help her in her work and her mother-in-law was also at home to help her. So she could find time to attend the centre. An *Uppari* (earth worker) woman said that since her husband was with his second wife, her mother used to help her. So, she could attend the centre regularly.

A *Musti* (backward class) woman said that her mother-in-law and co-sisters used to manage the farm work. So, she showed much interest in learning the lessons. A *Kurava* woman said that she used to do all her work quickly and attend the centre regularly. Her mother-in-law helped her now and then in her household work during her absence in serving food to her husband and in looking after the children. A *Musti* (backward class) woman said that her mother-in-law persuaded her to attend the centre and she used to look after her work and her children when she attended the centre.

*Family Background:* Presence of literate members in the family was another factor for motivation to participate. Many participants said their husbands were educated and some of them had school-going children. This made them attend the non-formal education programme. A *Musti* (backward caste) woman said that her husband

forced her to attend the centre. He was educated and so he wanted his wife to be educated. An *Uppari* (earth worker) woman said that she attended the centre with the idea of getting knowledge because her husband was educated up to sixth class. Her father-in-law and mother-in-law asked her not to attend. But she went to the centre with the permission of her husband.

A *Mangali* (barber) woman said that her sister was working as a midwife in Hyderabad. Hence, she was motivated to join the centre. She thought that after getting education, she too could work like her sister. A *Reddi* (upper caste) woman said that her sisters and brothers were educated. Her husband had studied up to fifth grade. Her two children were going to the school. So, she decided to get some education.

An *Ediga* (toddy-tapper) woman of a health programme village said that all her family members in her maternal house and in-laws' home were educated. Both her sons were going to the school. So, she said, that it would be good for her to attend the centre.

*Awareness of Deprivation:* Awareness regarding the necessity of education for climbing up the social ladder and their childhood deprivation was another factor for participation. A *Baliya* (backward class) woman said that she had a great desire to study in her childhood. But it was not possible for her to do so at that time. But, now the centre was nearer to her home and the teacher provided books, slates and everything to learn. Her husband and brother-in-law were educated. So, she decided to attend. She had picked up all the alphabets. Even on the day her brother-in-law died, she attended the centre without the knowledge of her family members. The neighbours also made fun of her for her regular attendance. But she did not pay heed to them.

Another woman said that she knew the alphabets in her childhood. So she wanted to learn more. An *Ediga* (toddy-tapper) woman said that she wanted to study in her childhood. But, being the eldest daughter it was not possible for her to go to school at that time. Her brothers and sisters attended the school.

*Ability to Take Risks:* Ability to take risks or weigh the negative consequences of a programme in order to reap the benefits from them was another factor for participation in the health programmes. A *Madiga* (Harijan) woman said that in the beginning her community people told her that she would be tubectomised if she attended the centre. But she said that she was ready to get operated because she is



the second wife and her husband is an old man. A *Telaga* (backward caste) woman mentioned that her husband refused to send her initially due to fear of family planning. But, she told him that nobody can do anything to her without her willingness.

Another *Telaga* woman mentioned that her husband refused to send her to the centre due to the fear of family planning. Her neighbours also told her the same. But she told them that she would not mind having an operation because she had already two children. She fought with her husband and attended the centre. A *Telaga* (backward class) woman said that her husband was reluctant to send her to the centre for fear of family planning. But she talked to other participants, convinced her husband that the project had nothing to do with family planning and attended the centre.

*Material Incentives:* Provision of incentives was a major factor for the continued attendance in the health programmes. An *Ediga* (toddy-tapper) woman said that her mother-in-law refused to send her in the beginning. Later, she agreed because the centre provided *balahar* and salad oil. A *Kurava* woman said that she attended regularly with the intention of getting *balahar*, salad oil and medicines. Although she was afraid of family planning, she attended because of suji and oil. A *Vadla* (blacksmith) woman said that the suji and oil given at the centre helped her a lot in feeding her children. But for them, she would not have attended. A *Reddi* (upper caste) woman said that she attended the centre only for the sake of medicines since she had three children.

Locational facility or proximity of the centre to the respondents' residence was another factor mentioned by the participants. A *Golla* woman said that in the beginning she did not attend because the centre was far away from her residence. Later when the centre was shifted to a place near her house, she started attending regularly. A *Kummari* woman and a *Telaga* woman said that since the centre was near their place of living, it was easy for them to attend the centre.

*Teacher Appeal:* A favourable opinion about the teacher and her teaching ability was another factor for continued participation. A *Telaga* (backward class) woman from a health programme village said that her teacher was very good and taught them good manners. Even if the incentives were not given, she would have attended the centre regularly. Another *Telaga* woman said that her teacher is very good and taught them 'everything'. She was ready to go to the centre even if she would not get incentives. Another *Telaga*

woman said that her teacher was good and kind and she wanted the same teacher again for her centre. She said that she would attend the centre again even if she didn't get medicines.

Finally, most respondents mentioned that they could find time to attend the centre. A literacy participant said that she had no farm-work and she never went for labour work. So, she could find time to go to the centre. A *Musti* (backward class) woman, belonging to a joint family, said that her mother-in-law and co-sisters were there to look after the farm-work. She had to do only the household work. So, she could show much interest in learning the previous lessons. Another woman said that since she had no children, she could attend the centre. Most women used to take their young children to the centre.

Thus, the factors favouring participation in the literacy and health programmes were many and varied. They included: (1) a high motivational level to obtain knowledge; (2) favourable encouragement and cooperation from the family members; (3) presence of literate persons in the family; (4) relative deprivation and awareness of the utility of education; (5) locational factor or physical proximity of the centre; (6) favourable perception of the teacher; and (7) leisure time available. Provision of incentives (supplementary feeding and health services) was a major factor for the large-scale participation in the service programmes.

## **Notes and References**

1. Kavalikars belong to the revenue department. They are lowest rung in the village cadre who assist the village officials in collecting the taxes and maintaining law and order in the village.
2. The teachers had instructions that they should not enrol any participant after the first month.



# APPENDIX 16

TABLE I: Percentage of participants, non-participants and drop-outs by experimental treatments (Phase II)

Treatments	Participants	Drop-outs	Non-participants	Total
FLIT	24.6 (16)	56.9 (37)	18.9 (12)	100.0 (65)
MCC	83.2 (124)	16.1 (24)	0.7 (1)	100.0 (149)
MCC+FLIT	78.2 (115)	26.5 (29)	2.1 (3)	100.0 (147)
Total	71.0 (225)	25.0 (90)	4.0 (16)	100.0 (361)

TABLE II: Number of respondents interviewed in service and non-service villages

	Non-service villages (FLIT)	Service villages (MCC and MCC+FLIT)	Total
Non-participants	52	31	83
Drop-outs	39	32	71
Participants	23	35	58
Total	114	98	212

## CHAPTER XXIII

# COST EFFECTIVENESS

**C.B. Padmanabhan**

Cost or Expenditure — Classification and Expenditure; Only Approximations; Unit Cost per Centre; Unit Cost per Beneficiary — Experimental Model — Unit Costs: Effectiveness of the Project — Cost Effectiveness Analysis: Procedure for Cost Effectiveness Analysis — The Gain Scores and Benefits.

### *Abstract*

In this chapter an attempt is made to allocate the expenditure available under various heads into the four experimental treatments. Based on this, per unit cost of benefit is computed and expressed as a ratio. Although the analysis is crude, the conclusion is very clear. The non-formal education classes provided in the MCC treatment resulted in greater change in attitude, knowledge, and practice for per unit of expenditure. With regard to literacy skill, more 'benefit' accrued to participants in FLIT treatment for per unit of expenditure than in MCC+FLIT.

THIS PROJECT WAS comparable to a training programme for the farmers with regard to its integrated nature. But in actual operation, this project was more complicated since it lacked a 'production function'. What is more, this itself was an experimental project.

### **Cost or Expenditure**

Cost in the economic sense is opportunity cost or the cost of displaced alternative. Therefore, it should include items like the value of the time of the participants in the training programme, if any, imputed value of the buildings that are used, etc. Even though the project head 'overheads' gives some imputed rent for the buildings used, etc., it is not complete.

In our analysis of the project, we have really used only the monetary expenditure incurred as revealed in the budget document. Hidden items of expenditure have not been reckoned nor the value of



international aid received through UNICEF assistance. It has also not taken into account expenditure of a non-recurring nature. Thus, the use of the term 'cost' in what follows is subject to the foregoing qualifications.

### **Classification and Expenditure**

Table I (see Appendix 17) gives the cumulative expenditure for both Phases I and II broken down under various heads and by type of experimental treatments. The last two columns of the table show that Research and Personnel has taken up the largest single chunk of the available resources. This is understandable from several points of view.

First, this was an experimental action-cum-research project in an area in which there was little authentic information. Field surveys had to be conducted for identifying the eligible population for the Bench Mark and for Resurvey. Even for the control group, expenditure had to be incurred in order to find out how the existing facilities of primary health centres were being used. Factors which had stood in the way of the full utilisation of the existing facilities had to be avoided in this project.

Second, research has to provide considerable guidance in the preparation of the curriculum materials based on local conditions. Only then could the functional literacy and non-formal education be woven around the actual local situation and its remedial requirements for the advancement of the objectives of the project.

Third, functional literacy and non-formal education programmes had always a built-in device for concurrent evaluation and part evaluative action. Thus, it covered expenditure incurred for evaluation also. Lastly, the expenditure incurred in the MCC centres was about eight times that of functional literacy centres. This was due to the cost of medicines and other supplies that were distributed to the participants.

*Only Approximations:* The total expenditure was divided into the number of expenditure categories and has been presented in Table I (see Appendix 17). The expenses incurred in the preparation of materials was divided by three, as the control group treatment did not have a share of this expenditure. As the MCC+FLIT treatment did not incur any additional expenditure (other than the teaching materials) for teaching functional literacy, the table reflects this as



well. Expenses incurred under the head 'Research and Personnel' were divided into four and apportioned for all the four treatments. This perhaps overstates the expenditure incurred by CONT. However, the table attempts to present approximations only.

The last but one row of Table I shows that the portion of total expenditure incurred by CONT was the lowest (20.7 per cent) and for MCC and MCC+FLIT was the highest (27.6 per cent). Perhaps the expectation that MCC and MCC+FLIT treatments will produce more 'lasting benefits' than CONT or FLIT was justified. As stated earlier, the research component (which also includes travel) was high in this project as this was an experimental project. In the MCC+FLIT treatment, the expenditure incurred under MCC (in medicines) was about eight times larger than that of expenditure under FLIT.

The last row of the table gives the expenses incurred for running the action programme. Any future projects which make use of the materials prepared in this project may be expected to incur a similar magnitude of expenditure. It will be seen that the cost for running a MCC programme was about three times more than that of FLIT programme.

*Unit Cost per Centre:* As the number of centres in each of the treatments differed, mean expenditure per centre was computed and is presented in Table II (see Appendix 17). The table throws light on the per centre expenditure under various heads, of possible use as a guideline in respect of any similar future projects.

*Unit Cost per Beneficiary:* It may be recalled that the entire project was planned for 900 beneficiaries (240 for Phase I and 660 for Phase II). Out of this only 714 (185 for Phase I and 529 for Phase II) participated in the Bench Mark Survey or agreed to participate in the experimental manipulation. Excluding those who never attended the classes or attended less than 25 per cent of the classes, 556 women were operationally defined as those who could have benefited from the experimental treatment.

The numbers by treatment were: CONT 227; FLIT 29; MCC 151; and MCC+FLIT 149. The number of children who benefited from the medical nutritional service components of the two MCC treatments are not included for the purposes of these computations. Although for the sake of completeness, data are presented in the table for CONT also, the discussion will only be on the other three treatments. Table III (see Appendix 17) presents the details.

The row giving 'total' in Table III shows that the mean



expenditure per beneficiary in FLIT was Rs.10,800, whereas it was Rs.2,366 in MCC. The expenditure in the FLIT was about four times than that in MCC because of the number of beneficiaries involved. Table II shows that in terms of the expenditure per centre, the FLIT centres cost more than the MCC centres. In terms of cost per unit of input, it is not economical to run a centre if the number of potential beneficiaries is small.

The last but one row of Table III gives the mean expenditure per beneficiary for programme operations. The expenditure is about Rs.790 (rounded off) for FLIT and about Rs.450 (rounded off) for MCC and MCC+FLIT. In view of the fact that the programme lasted for nearly 11 months, this amount cannot be considered high. In the last row of the table we have also computed the per beneficiary cost assuming that the targeted number of beneficiaries had attended. Perhaps these figures could be utilised as 'rules of thumb' for future projects.

### **Experimental Model**

Since these two phases of the project were experimental, designed to 'evolve a model' for wider testing, it would be unrealistic to apportion the material preparation and research costs to the sample 'beneficiaries' who participated in the programme. In fact, the participants were analogous to 'guinea pigs' used for testing and re-testing materials and the effectiveness of the programme.

Even the number of beneficiaries per village was experimentally limited to a maximum of 30. Drop-outs or refusals were not replaced in order to study attrition. The quality of staff and teacher/student (doctor/patient) ratio were both kept high, since more teaching materials or medical services were being tested than would be recommended as practicable for wider dissemination. Yet, for illustrative purposes unit costs are worked out and presented.

### **Unit Costs**

In assessing the efficiency or effectiveness of any project, especially with reference to the efficiency with which the resources have been used, an essential step is to have unit cost, i.e., the cost per unit incurred. For this purpose, we have to decide on the unit. We have the size of the eligible population, the size of the population which has

been exposed to the Bench Mark Survey and the size of the population which was eligible for Resurvey, that is, the participants who had attended at least 25 per cent of the classes. We can say that the number of those who participated in the programme constituted the ultimate beneficiaries of the project. Those who were taken up for Bench Mark were the enrolled population, like the students enrolled at a given level of education. To continue the analogy, those who had eventually benefited – the ultimate beneficiaries – were only those who had ultimately graduated.

*Effectiveness of the Project:* So far we have been concerned only with the cost side of the project. We have also looked at the internal efficiency or the efficiency with which a mother enrolled becomes a beneficiary from the project.

Another way in which efficiency can be assessed is by comparing the unit costs with unit costs of other projects of a similar nature. But there are no projects of this kind for which cost information is available. The World Bank study made by Philip Coombs and Ahmed<sup>1</sup> contains information on costs which are in US dollars. Conversion of Indian rupees into US dollars or vice versa will present a distorted picture and hence we refrain from this comparison.

### Cost Effectiveness Analysis

A number of similar terms with more or less same meanings such as cost effectiveness analysis, cost utility analysis, or cost benefit analysis are in current use. Cost benefit analysis as used in economic theory can be employed only when the benefit of a project can be measured in units directly comparable to its costs, i.e., generally in monetary units. In such a case, the benefit by cost ratio is calculated to give a basis for decision concerning the profitability of a project.

When the benefit of a project or a programme cannot be measured in terms of money, the approach to be adopted is to define some measure of effectiveness or utility which is related to the objective of the activity envisaged. The term effectiveness is used in the place of benefit to represent such situations. It can take either of the two following forms:

- (a) A comparison is made between the costs of different alternatives having the same measure of effectiveness, i.e., fulfilling the given objective to the same extent. The less costly alternative is



considered to be the best one.

- (b) A comparison is made between the effectiveness of the different alternatives which can be obtained with a given budget level. The alternative giving the highest effectiveness is preferred.

*Procedure for Cost Effectiveness Analysis:* Ideally the following is the procedure for cost effectiveness analysis:

*The objective:* The objective should be clearly laid down and there should be agreement on a single goal. Where there is a multiplicity of goals, there should be a weighted index, based on several objectives. Effectiveness is the measure of the extent to which the weighted index is achieved.

- Identification of the alternatives which are relevant.
- Cost associated with each alternative should be carefully identified. Special care should be taken to ensure that joint costs are properly allocated.
- Perhaps a model to estimate the costs associated with each alternative should be helpful.
- There should also be a decision rule which points out the choice that has to be made; for example, efforts should be made for minimising the rupee cost for a fixed benefit or the benefit for a fixed cost should be maximised.

When we try to apply the above procedure to the project, the first step is to measure the effectiveness. The project had several objectives and sub-objectives. As summarised in Chapter XXV, the effectiveness was measured by: (i) gain in knowledge, attitude and practice; (ii) gain in literacy skill; (iii) reduction of nutritional deficiency of mothers and children; (iv) gain in height and weight of children; (v) change in the motor and mental ability of children; (vi) change in the cognitive structure of adult women, etc. All these measures were in different matrices and hence cannot be easily combined to yield one index of benefit.

### **The Gain Scores and Benefits**

Purely for illustrative purposes the gain registered in knowledge, attitude, and practice in the area of health care and gain in literacy skills (presented in Table I of Chapter XXV), will be analysed in this chapter. Since this was designed as a field experiment, any gain or benefit that has accrued to the participants in the three action programmes is relative to the level of the women in the control groups.

For example, the total mean gain scores in the area of health care were as follows: CONT 2.25; FLIT 3.33; MCC 5.62; MCC+FLIT 4.76 (Table I in Chapter XXIV). So the 'benefit scores' for the women or net effectiveness of the experimental treatment in FLIT over CONT was  $3.33 - 2.25 = 1.08$ .

Similarly for MCC, it was 3.37 and for MCC+FLIT it was 2.51. Using these benefit scores as the denominator and the mean expenditure per beneficiary (given in Table II) as the numerator, it comes to an 'unit cost of benefit' for FLIT at Rs.731, and for MCC and MCC+FLIT at Rs.132 and Rs.179 respectively. (These figures do not include the cost of nutrition supplements provided to the participants.)

Making use of MCC as the reference, it will be seen that 5.5 times more expenditure was required in FLIT to produce the same unit of health education benefit as in MCC and 1.4 times more expenditure in MCC+FLIT was required. Keeping in mind the crudeness of the measures utilised, it can still be stated that the MCC treatment produced or resulted in more benefit for the rural women than the other two treatments.

Similarly the benefit score for literacy skill was 26.01 for FLIT, and 4.37 for MCC + FLIT. (As no literacy classes were conducted in MCC, it is not calculated for the MCC treatment.) The per unit cost of effectiveness for literacy in FLIT was Rs.30 and Rs.103 for MCC+FLIT. To put it differently, three times more expenditure was required in MCC+FLIT to produce the same level of literacy skill as in FLIT.

## Notes and References

1. Philip C. Coombs and Manzoor Ahmed, *Attacking Rural Poverty: How Non-formal Education can Help?*, New York: International Council for Education, 1974.



## APPENDIX 17

TABLE 1: Expenditure of the project (in rupees) incurred under various heads of expenditure by type of experimental treatments (Phases I and II)

Heads of expenditure	Experimental treatments			Total		Costs
	CONT	FLIT	MCC	MCC+FLIT		
1. Material preparation	Nil	7.3%	6.4%	6.4%	5.3%	(68,748)
2. Training	Nil	1.9	1.7	1.7	1.4	(18,205)
3. Literacy Centres	Nil	5.4	Nil	Nil	1.3	(16,824)
4. MCC Centres	Nil	Nil	17.0	17.0	9.4	(121,697)
5. Research and Personnel*	57.9	49.4	43.3	43.3	47.0	(619,330)
6. Travel	21.9	18.7	16.4	16.4	18.1	(234,442)
7. Overheads	20.2	17.2	15.1	15.1	16.7	(215,849)
Total	100.0 (267406)	99.9 (313214)	100.0 (357239)	100.0 (357239)	100.0 (1295094)	(1,295,094)
Cost for action programme operation (Items 2-4)	(20.7)	(24.2)	(27.6)	(27.6)	(100.0)	
	—	22892	66917	66917	—	

\*Personnel include research staff, senior supervisory staff (e.g., Project Officers) and senior administrative staff.

TABLE II : Mean expenditure per centre (in rupees) incurred by the project under various heads of expenditure by type of experimental treatments (Phases I and II)

Heads of expenditure	Experimental Treatments				Total
	CONT	FLIT	MCC	MCC + FLIT	
	N=8	N=6	N=8	N=8	N=22
1. Materials preparation	Nil	3819	2865	2865	2292
2. Training	Nil	1011	759	759	607
3. Literacy centres	Nil	2804	Nil	Nil	561
4. MCC centres	Nil	Nil	7606	7606	4057
5. Research and personnel	19354	25806	19354	19354	20644
6. Travel	7326	9769	7326	7326	7815
7. Overheads	6745	8994	6745	6745	7195
Total	33426	50800	44655	44655	43170

TABLE III: Mean expenditure per 'beneficiary'\* (in rupees) incurred by the project under various heads of expenditure by type of experimental treatments (Phases I and II)\*\*

Heads of expenditure	Experimental treatments				Total
	CONT	FLIT	MCC	MCC + FLIT	
	N=227	N=29	N=151	N=449	N=556
1. Material preparation	Nil	790	152	154	124
2. Training	Nil	209	40	41	33
3. Literacy centres	Nil	580	Nil	Nil	30
4. MCC centres	Nil	Nil	403	408	219
5. Research and personnel	682	5339	1025	1039	1114
6. Travel	258	2021	388	393	422
7. Overheads	238	1861	357	362	308
Total	1178	10800	2366	2398	2329
Cost for action programme operation (Items 2-4)	—	789	443	449	—
Cost of programme per targeted beneficiary	—	125	280	280	—

\* Defined as those who attended at least 25 per cent of the classes in the action treatments.

\*\* Computed from data presented in Tables IX and XIV of Chapter IV.



**Part V**

**FINDINGS, CONCLUSIONS AND IMPLICATIONS**

## CHAPTER XXIV

# FINDINGS AND INTERPRETATION

**Victor Jesudason**

Knowledge and Practice in the Area of Health Care: Presentation of Data; Statistical Tests of Significance — General Health Practices: Children's Diseases; Health during Pregnancy — Knowledge and Practice in the Area of Nutrition: Functions of Food; Nutrition during Pregnancy and Lactation; Extra Amount of Food during Pregnancy and Lactation; What the Other Women do in the Village; Lack of Financial Resources; Breast Milk and Weaning Foods; Semi-solid Foods; Special Food for Toddlers; Type of Foods Consumed during Pregnancy; Type of Foods Consumed during Lactation; Food Taboos; Information on Potential Facilities — Knowledge and Attitude towards various Family Planning Techniques: Fear of Forcible Sterilisation — Achievement in Literacy Skill: Functional Literacy; Low Level of Achievement; Reasons for Low Level — Global Measures of Change: Knowledge about Land Ownership and Taxation; Aspiration for Children — Child Mortality during the Study Period — Other Possible Sources of Change — Variables: Socio-economic Status; Family Situation; Demographic Characteristics — Dependent Variables — Mode of Analysis — Interpretation: Interpretation of Data; Change Not due to Socio-Economic Status; Change not due to Family Characteristics; More Change with Greater Number of Pregnancies; Change due to Experimental Manipulation — Summary and Conclusions: Sample Attrition and its Implications; Knowledge, Attitude and Practice in the Areas of Health, Nutrition and Family Planning; Child Mortality — How Lasting Were the Gains?; Scales; Mode of Presentation; Findings; To Sum Up.

### *Abstract*

This chapter presents data at two points in time in respect of those who were available for both Bench Mark Survey and Resurvey. The major discussion will centre around the Phase II data because of the substantial number of women in the study. Phase I data will be used mostly to draw inferences about retention of knowledge and attitude.

IN THIS PROJECT, major emphasis was given to prevention rather than cure. This was because at the current level of economic development and infrastructure present in or planned for the rural areas, curative medical care cannot be made available adequately to a very large section of the population.



### Knowledge and Practice in the Area of Health Care

On the assumption that the rural people are not able to prevent many minor ailments due to ignorance, the project sought to impart knowledge and information and also tried to change attitude and practice in the area of health care. In addition, it was also assumed that among all the groups, children, pregnant and lactating women are more vulnerable to disease than others. So the level of knowledge at both Bench Mark and Resurvey periods were measured in the preventive aspects of health care of children and pregnant women.

The manner in which the project was designed and carried out implied that the magnitude of change or gain ( $G$ ) will be the highest in MCC+FLIT treatments. This is so, because that treatment had both non-formal education (through informal teaching, discussion and demonstration) and functional literacy. It will be the lowest (if at all there is any) in the CONT. The changes in FLIT were hypothesised to be greater than that of changes in CONT, and changes in MCC to be greater than or equal to changes in FLIT but lower than that of changes in MCC+FLIT. Symbolically,

$$\bar{G}_{\text{CONT}} < \bar{G}_{\text{FLIT}} < \bar{G}_{\text{MCC}} < \bar{G}_{\text{MCC+FLIT}}$$

Where  $\bar{G}$  denotes gain during the experimental period.

*Presentation of Data:* As indicated earlier, data were collected for Phase I at three points in time, namely, before the experimental manipulation or  $t_0$  (May, 1973), at the end of the experimental manipulation or  $t_1$  (May, 1974) and during January 1975 or  $t_2$ . For Phase II, the data were collected at two points in time, namely, before the experimental manipulation or  $t_0$  (October-November 1973) and at the end of the experimental manipulation or  $t_1$  (February-March 1975).

The scale items that were in the measuring instrument were so structured as to assign a score of 'zero' for wrong answers and 'one' for correct answers. The tables that present data on the scale item (denoted by numerals, e.g., 4-D 4.1) display the per cent who gave the correct answer at  $t_0$  or Bench Mark Survey and at  $t_1$  or Resurvey. In addition the score obtained by an individual woman at  $t_0$  was subtracted from the score obtained at  $t_1$ . The resultant score will be referred to as 'Gain Score' ( $G$ ). Symbolically,

$$G_i = Y_i - X_i$$



where,  $Y_i$  is the score obtained *after* the completion of the experimental manipulation ( $t_1$ ),  $X_i$  is the score obtained before the start of the manipulation ( $t_0$ ), and  $G_i$  is the gain or change between the two measures. All the three scores are for the individual as denoted by the subscript. As a summary measure, the mean of individual differences (or  $\bar{G}$ ) will be presented.

As the scale items were scored as 0 and 1 for both the Bench Mark Survey and the Resurvey, the score  $G_i$  can vary from  $-1.00$  to  $+1.00$ . The former indicates that a respondent gave the correct answer at  $t_0$  or Bench Mark Survey and wrong answer at  $t_1$  or Resurvey. The reverse is the case for the latter score. If a respondent gave wrong answers at *both* times, the  $G_i$  will be 0. The score  $G_i$  does not give credit to those who knew the correct answer before the experimental manipulation, i.e., at  $t_0$  and also for the correct answer at  $t_1$ , for the knowledge about the correct answers were independent of experimental manipulation.

On the other hand, if a respondent gave the correct answer at  $t_0$  and the wrong answer at  $t_1$ , the  $G$  score is negative, for the change in the reverse direction has occurred during the experimental period. The  $G_i$  scores are to be interpreted as the change that has occurred during the experimental period and the change in the 'expected' direction was given positive weights. The mean Gain Score ( $\bar{G}$ ) varies from  $-1.00$  to  $+1.00$ .

The  $\bar{G}$  were summed and presented as Total  $\bar{G}$  score for the subsets of a scale and also for the entire scale. It simply indicates the change (or gain) that has occurred for that scale. Since, the various scales have a varying number of items, to facilitate comparison across the scales, the Total  $\bar{G}$  score for a scale was divided by the number of items in that scale and presented as Total Standardised  $\bar{G}$  scores. This simple division was possible because nearly all the items were equally weighted.

*Statistical Tests of Significance:* Two types of tests of significance will be used. First, the  $F$  values will be made use of to test the null hypothesis that the observed  $\bar{G}$  values for the four experimental treatments are from the same population. If the null hypothesis is rejected at a probability level less than that of .05 level, it indicates that the experimental manipulation had differential impact on the four treatments. Second, 't' tests of differences between means for the control treatment and each of the other treatments were computed for the subscales and entire scales and presented in the table. This



indicates whether the women, in that particular group, on the average, registered significantly different changes from the control group or not. Finally, 't' tests were computed between MCC and MCC+FLIT groups to examine whether the differences between these groups were significant or not.

TABLE I: Knowledge and practice in the area of health care: per cent who gave correct responses at the time of Bench Mark (BM) and Resurvey (RS) and mean change scores ( $\bar{G}$ ) by type of experimental treatment (Phase II)

Knowledge and practice in the area of health care		Experimental treatments			
		CONT N=114	FLIT N=12†	MCC N = 94	MCC+ FLIT N=104
1		2	3	4	5
<i>A. General health practices:</i>					
1. Knowledge that flies dirty food	BM	15.8	0.0	13.8	15.4
	RS	17.5	0.0	-5.3	-4.8
	$\bar{G}$	0.02	0.0	-0.09	-0.11
2. Treatment of drinking water to make it safe	BM	0.9	16.7	0.0	2.9
	RS	3.5	68.3	63.8	38.5
	$\bar{G}^*$	0.03	0.42	0.64	0.36
3. Practice of covering food	BM	86.0	75.0	86.2	78.8
	RS	91.2	100.0	98.9	98.1
	$\bar{G}$	0.05	0.25	0.13	0.19
4. Practice of combing hair regularly	BM	23.7	33.3	19.1	19.2
	RS	70.2	66.7	77.7	80.8
	$\bar{G}$	0.47	0.33	0.59	0.62
5. Practice of taking bath daily	BM	11.4	16.7	5.3	8.7
	RS	19.3	8.3	13.8	18.3
	$\bar{G}$	0.08	-0.08	0.09	0.10
6. Degree of cleanliness of clothes @	BM	1.54	1.58	1.54	1.48
	RS	1.81	1.83	1.94	1.83
	$\bar{G}$	0.31	0.25	0.34	0.35
Sub-total	$\bar{G}^*$	0.95	1.17	1.69**	1.50**
<i>B. General health habits for children:</i>					
1. Knowledge about proper habits to be taught before taking meals	BM	11.4	8.3	9.6	9.6
	RS	4.4	16.7	33.0	18.3
	$\bar{G}^*$	-0.07	0.08	0.23	0.09

(Contd.)

TABLE I (Contd.)

1		2	3	4	5	
2.	Knowledge about proper habits to be taught <i>after</i> taking meals	BM RS $\bar{G}^*$	7.0 3.5 -0.04	0.0 16.7 0.17	7.4 25.5 0.18	8.7 13.5 0.05
3.	Knowledge about stage at which children's teeth are to be cleaned	BM RS $\bar{G}^*$	7.0 9.6 0.03	8.3 8.3 0.00	5.3 22.3 0.17	3.8 25.0 0.21
	Sub-total	$\bar{G}^*$	-0.08	0.25	0.59**	0.35**
C. Knowledge about precautions for children's diseases:						
1.	Knowledge that the vaccinated area should not be wiped off	BM RS $\bar{G}^*$	60.5 67.5 0.07	16.7 66.7 0.50	59.6 93.6 0.34	44.2 76.0 0.32
2.	Knowledge about proper methods to take care of vaccination wound	BM RS $\bar{G}$	1.8 14.0 0.12	0.0 0.0 0.00	7.4 25.5 0.18	4.8 16.3 0.12
3.	Will suggest to a neighbour that her child should take smallpox vaccination	BM RS $\bar{G}^*$	57.0 80.7 0.24	75.0 83.3 0.08	52.1 95.7 0.44	56.7 89.4 0.33
4.	Knowledge about precautions to avoid eye infections	BM RS $\bar{G}^*$	0.0 0.0 .00	0.0 0.0 .00	0.0 18.1 .18	0.0 9.6 .10
5.	Knowledge about what to do when a child has diarrhoea	BM RS $\bar{G}$	10.5 36.8 0.26	33.3 58.3 0.25	11.7 57.4 0.46	7.7 40.4 0.33
6.	Ability to identify whooping cough	BM RS $\bar{G}^*$	9.6 32.5 0.23	16.7 33.3 0.17	9.6 70.2 0.61	9.6 57.7 0.48
	Sub-total	$\bar{G}^*$	0.92	1.00	2.20**	1.66**
D. Health care during pregnancy:						
1.	Knowledge that any pregnant woman should get herself medically examined	BM RS $\bar{G}^*$	7.9 45.6 0.38	8.3 66.7 0.58	17.0 94.7 0.78	10.6 92.3 0.82

(Contd.)



TABLE I (Contd.)

1		2	3	4	5
2. Knowledge about symptoms of illnesses during pregnancy that need medical attention	BM RS $\bar{G}^*$	19.3 27.2 0.08	8.3 41.7 0.33	23.4 59.6 0.36	15.4 58.7 0.43
Sub-total	$\bar{G}^*$	0.46	0.92	1.14**	1.25**
Grand total	$\bar{G}^*$	2.25	3.33	5.62**	4.76**
Total Standardised Score	$\bar{G}^*$	0.13	0.20	0.33**	0.28**

Note: \* $F$  value significant at .05 level.

\*\*\* $t$  value of the difference between that score and that of the control is significant at .05 level.

@ Coded as: Dirty 1; fairly clean 2; clean 3.

† As the  $N$  is small, data should be interpreted with caution.

Table I presents relevant data on health care. The last but one row of the table shows that the women in all the four treatments have shown positive change. The statistically significant  $F$  value shows that the observed total change scores for the four groups were not from the same population, i.e., the four experimental treatments registered differential impact.

The change was highest for the MCC treatment, followed by the MCC + FLIT treatment ( $p < .05$ ). This is not quite the same order as the hypotheses symbolically described above. This indicates that the expected magnitude of change for MCC+FLIT (where the functional literacy classes were assumed to produce interaction effects) did not occur.

The mean  $G$  scores of MCC and MCC+FLIT treatments were statistically significantly different from the mean change score of CONT. On the other hand, the total mean  $G$  score of FLIT was not significantly different from that of CONT. This indicates that the change that was observed among the women in the FLIT treatment was minimal when compared with women in the control experimental treatment. Although the number of women in the FLIT treatment was too small ( $N = 12$ ) to draw any definite conclusions, the data suggest that the message content of the functional literacy lessons did not

produce the expected quantum of change in knowledge, attitude and practice with regard to health care. This observation is further strengthened when each of the sub-scales are examined. All the change scores presented as sub-totals in the table, without any exception, exhibit the relationship outlined above.

### General Health Practices

Panel A of Table I gives the individual scale items for the sub-scale 'General Health Practices'. It will be seen that certain health practices like keeping cooked food covered (so as to avoid flies from sitting on them or dirt and dust falling into them) and combing hair regularly (indicative of personal cleanliness) were reported to have been practised by a majority of the women in the study before the start of the project. Among all the six scale items, a high magnitude of change was registered with regard to treatment of water to make it safe for drinking.

Panel B gives the three individual scale items which measured general health habits for children. In contrast to the earlier panel, the health habits were practised by a few women only (less than 10 per cent) before the start of the project. All the three items show a moderate degree of positive change in MCC and MCC+FLIT treatments.

*Children's Diseases:* Panel C gives the scale items in the area of children's diseases. It is assumed that if mothers have knowledge about common diseases that affect children, they may take proper precautions at the appropriate time. This could facilitate prevention of those diseases or at least prevent them from being severe. The first three items relate to smallpox vaccination. Although the law requires that all children should be vaccinated, the problem survey showed that many avoid vaccination. Among those who take it, many wipe off the area immediately after vaccination so as to make it ineffective; they are also ignorant about the proper method for taking care of the vaccination wound. The table shows that positive changes have occurred in all the three action treatments. Among the three, the MCC treatment had registered the greatest change ( $p < .05$ ) followed by MCC+FLIT and FLIT.

The next three items deal with selected common diseases which affect children. Although the non-formal education classes dealt with many such common diseases, only three were selected and measured.



The table shows that during the Bench Mark Survey, proper knowledge about these diseases was practically absent. During the Resurvey, positive gain was registered in knowledge in the three action treatments.

*Health during Pregnancy:* Panel D (Table I) deals with health care during pregnancy. In this panel also (similar to earlier panels) proper or accurate knowledge before the start of the experimental treatment was low and positive changes have occurred during the experimental treatment period. The change was pronounced in MCC and MCC+FLIT treatments, when compared with CONT and FLIT treatments.

Table I shows very clearly that in respect of those items selected from among the themes that were dealt with in the non-formal education classes, positive changes have occurred. Those positive changes were more pronounced in the case of MCC, followed by MCC+FLIT. The magnitude of change as indicated by Total Standardised Scores shows that about a third (.33 or 33 per cent in MCC and .28 or 28 per cent in MCC+FLIT) of the women on the average gained in knowledge and attitude. More concentrated and systematic efforts are called for, if the change is to be more pervasive.

### **Knowledge and Practice in the Area of Nutrition**

A major contributing factor for ill-health and disease in the countryside has been the lack of proper nutrition. Poor economic resources may be largely responsible for lack of nutritious food in the daily diet, but there are also other sociological factors leading to unbalanced diet. Two such factors that may be identified are: ignorance and cultural factors. Often due to lack of knowledge, the proper combination of foods are not consumed.

In some families and in some foods, the most nutritious portions of certain foods are thrown away and the less nutritious portions are consumed. During certain stages in the life-cycle (e.g., adolescence, pregnancy and lactation) the body needs more food than at other times. Due to ignorance, food intake is often consciously curtailed during periods when they are needed most. All these factors associated with lack of proper information generally lead to anaemia. In this state, people are more susceptible to diseases which, if contacted, could prove to be fatal.

In rural areas especially certain foods are culturally defined as

taboo during pregnancy and/or lactation and also during specified seasons. Such foods are often very nutritious. Although these foods are consumed during other times, they are avoided during pregnancy and lactation when the body requires more of nutritious foods. This could also result in general anaemia.

It should be emphasised that the general economic level of a population determines the quantum of nutritious food available for consumption. But it is assumed that a population need not have to wait till their economic status improved in order to consume nutritious food. At any economic level, it should be possible to develop at least a few facilities so that more nutritious food can be made available.

Taking all these into consideration the non-formal education classes laid a heavy emphasis on nutrition. Table II presents relevant data on all these themes. The postulated form of relationship among the four experimental treatments is similar to that of Table I.

Table II displays data regarding knowledge and practice in the area of nutrition. The last but one row shows that positive changes have taken place in all the experimental treatments. In order of magnitude, MCC is followed by MCC+FLIT ( $p < .05$ ) which in turn is followed by FLIT and CONT. Here again the general hypothesis that MCC+FLIT will register more change than MCC was not supported.

Further, it should be pointed out that the scores for MCC and MCC+FLIT were significantly different from CONT. But statistically the scores for FLIT were not significantly different from that of CONT. In general, it can be stated that the experimental treatments had differential impact on the women (as shown by  $F$  values) and the impact was more pronounced for MCC and MCC+FLIT treatments (as shown by 't' values).

*Functions of Food:* As stated earlier, one of the major areas of lack of knowledge was with regard to the functions of food. People were often not aware of what various foods can do to the body. A substantive portion of nutrition lessons dealt with functions of food and a balanced diet. Panel A of Table II provides the relevant data. The mean change scores for the subset (Panel A) shows that the experimental manipulation had statistically significant differential impact on the groups. The mean changes were pronounced for MCC, followed by MCC+FLIT.

Regarding functions of foods, such as cereals, pulses and fruit, milk and oils, a substantial proportion of people (ranging from 30 to 60 per cent) had adequate knowledge even at the time of the Bench



TABLE II: Knowledge and practice in the area of nutrition: per cent who gave correct answers during Bench Mark (BM) and Resurvey (RS) and mean change scores ( $\bar{G}$ ) by type of experimental treatment (Phase II)

Knowledge and practice in the area of nutrition		Experimental treatments			
		CONT (N=114)	FLIT (N=12)†	MCC (N=94)	MCC+ FLIT (N=104)
1		2	3	4	5
A. General nutrition:					
1. Knowledge about functions of food					
a) Cereals	BM	44.7	50.0	52.1	63.5
	RS	79.8	91.7	98.9	99.0
	$\bar{G}$	0.35	0.42	0.47	0.36
b) Pulses and nuts	BM	31.6	33.3	28.7	40.4
	RS	70.2	100.0	98.9	95.2
	$\bar{G}^*$	0.39	0.67	0.70	0.55
c) Meat, fish and eggs	BM	1.8	0.0	1.1	2.9
	RS	0.9	0.0	20.2	4.8
	$\bar{G}^*$	-0.01	0.00	0.19	0.02
d) Milk and its products	BM	64.9	83.3	75.5	66.3
	RS	76.3	83.3	94.7	99.0
	$\bar{G}^*$	0.11	0.00	0.19	0.33
e) Vegetables	BM	0.0	0.0	0.0	0.0
	RS	0.0	0.0	0.0	4.8
	$\bar{G}^*$	0.00	0.0	0.0	0.05
f) Fruit	BM	0.0	0.0	0.0	0.0
	RS	0.0	0.0	3.2	1.0
	$\bar{G}$	0.00	0.00	0.03	0.01
g) Oils	BM	42.1	41.7	39.4	51.0
	RS	84.2	100.0	91.5	91.3
	$\bar{G}$	0.42	0.58	0.52	0.40
2. Knowledge/opinion scores regarding food groups that should be included in daily diet	BM	9.18	7.08	9.00	9.04
	RS	9.02	10.42	10.77	10.28
	$\bar{G}^*$	-0.16	0.58	1.77	1.24
Sub-total	$\bar{G}^*$	1.11	2.25	3.87**	2.95**

TABLE II (Contd.)

1		2	3	4	5
<b>B. Nutrition during pregnancy:</b>					
1. Knowledge about proper foods to be eaten during pregnancy	BM	7.0	16.7	2.1	1.9
	RS	15.8	66.7	63.8	46.2
	$\bar{G}^*$	0.09	0.50	0.62	0.44
2. Practice of taking any food in extra amount during pregnancy	BM	49.1	41.7	44.7	54.8
	RS	40.4	33.3	66.0	72.1
	$\bar{G}^*$	-0.09	-0.08	0.21	0.17
3. Knowledge that other women in the village take any food in extra amount during pregnancy	BM	42.1	66.7	41.5	60.6
	RS	56.1	66.7	72.3	74.0
	$\bar{G}$	0.14	0.00	0.31	0.14
4. Will take food in extra amount during pregnancy if sufficient money is available	BM	67.5	83.3	71.3	79.8
	RS	59.6	83.3	85.1	87.5
	$\bar{G}^*$	-0.08	0.00	0.14	0.08
Sub-total	$\bar{G}$	0.06	0.42	1.28**	0.83**
<b>C. Nutrition during lactation:</b>					
1. Practice of taking any food in extra amount during lactation	BM	35.1	50.0	26.6	36.5
	RS	64.0	66.7	93.6	91.3
	$\bar{G}^*$	0.29	0.17	0.67	0.55
2. Knowledge that other women in the village take any food in extra amount during lactation	BM	16.7	33.3	22.3	26.9
	RS	53.5	66.7	69.1	78.8
	$\bar{G}$	0.37	0.33	0.47	0.52
3. Will take food in extra amount during lactation if sufficient money is available	BM	28.9	41.7	30.9	40.4
	RS	49.1	50.0	79.8	70.2
	$\bar{G}^*$	0.20	0.08	0.49	0.30
Sub-total	$\bar{G}^*$	0.86	0.58	1.63**	1.37**
<b>D. Nutrition for children:</b>					
1. a) Knowledge that semi-solid foods can be given to children before teething	BM	39.5	16.7	21.3	30.8
	RS	47.4	75.0	92.6	87.5
	$\bar{G}^*$	0.08	0.58	0.71	0.57

(Contd.)



TABLE II (Contd.)

1		2	3	4	5
b) Knowledge that semi-solid foods can be digested by children before teething	BM RS $\bar{G}^*$	0.0 24.6 0.25	0.00 41.7 0.42	0.0 81.9 0.82	1.0 63.5 0.63
2. Aware of reasons for special food for toddlers	BM RS $\bar{G}^*$	0.0 43.0 0.43	0.0 58.3 0.58	1.1 83.0 0.82	2.9 76.9 0.74
3. Cook special food for her toddlers	BM RS $\bar{G}^*$	7.0 8.8 0.02	0.0 25.0 0.25	6.4 51.1 0.45	5.8 43.3 0.38
Sub-total	$\bar{G}^*$	0.77	1.83**	2.80**	2.31**
Grand Total	$\bar{G}^*$	2.80	5.08	9.57**	7.45**
Total Standardised Score:	$\bar{G}^*$	0.15	0.27	0.50**	0.39**

\* F value significant at .05 level.

\*\* 't' value of the difference between that score and that of control is significant at .05 level.

† As the N is small, data should be interpreted with caution.

Mark Survey. During Resurvey more people had adequate knowledge, this being more pronounced in MCC and MCC+FLIT treatments.

With regard to food groups such as meat, fish, eggs, vegetables and fruit, very few had adequate knowledge. The periodic dietary surveys conducted as part of the project (reported elsewhere) showed that these food groups were consumed by very few families in this area. It can be stated that not consuming these foods and lack of knowledge are associated. Even at Resurvey, the gain in knowledge with regard to these foods were minimal.

*Nutrition during Pregnancy and Lactation:* Panels B and C (Table II) give some relevant data with regard to nutrition during pregnancy and lactation. As stated earlier the non-formal education classes were mostly aimed at pregnant and lactating women and children (0-36 months old). The earlier problem surveys and our own observations clearly showed that nutrition during pregnancy and lactation was very inadequate. The education classes stressed that better quality of foods (i.e., protected foods) should be consumed and a greater quantity of

the normal food should be consumed during that period.

The evaluation process tried to tap the multifaceted aspects of this area. Direct questions were asked about whether the women consumed any food in *extra* amount during pregnancy and lactation. The women's level of knowledge was gauged with regard to proper food that should be eaten during pregnancy. Questions on peer group food practices were asked. On the assumption that if the women were aware that other women in the village consume food in extra amount during pregnancy and lactation they themselves may also consume in extra amount. To put it differently, awareness of peer group practices may act as an incentive to consume extra food.

Item 1 in Panel B of Table II displays the results. During the Bench Mark Survey, very few people had such knowledge. But during Resurvey, such knowledge increased greatly. The  $\bar{G}$  scores show that the magnitude of change was highest in MCC, followed by FLIT and MCC+FLIT. If it could be assumed that knowledge could lead to practice, these women may not suffer from lack of nutrition during pregnancy and lactation.

*Extra Amount of Food during Pregnancy and Lactation:* Panel B, item 2 displays the result for pregnancy and Panel C, item 1 for lactation. On the average, about one-half of the women reported at the time of the Bench Mark Survey that they consumed a greater quantity of food during pregnancy and about one-fourth reported eating more during lactation. During Resurvey that proportion increased and the increase was very pronounced in MCC and MCC+FLIT treatments.

When the mean  $G$  scores for pregnancy and lactation are compared, it can be seen that the change is slightly more pronounced for lactation than for pregnancy. The belief in this area is that if a pregnant woman consumes more food, the child will become fat or big and she will have a difficult labour. Therefore, people reduce the food intake during pregnancy. Perhaps this belief was so strong that the educational programme could not register the same amount of change as that shown in the area of lactation.

*What the Other Women do in the Village:* Third, questions were framed on the assumption that if the women were aware of the fact that other women in the same village consume food in extra amounts during pregnancy, the women in the programme may be more prone to adopt that practice. It may be recalled that the non-formal education classes relied on discussion among the participants. During those discussions the fact that some women in the group ate food in



extra amount without it resulting in difficult labour was brought out. The results are displayed in Panel B, item 3 for pregnancy and Panel C, item 2 for lactation. During the Bench Mark Survey about 42 to 67 per cent of the respondents were aware of the fact that other women in the village consume food in extra amount. This proportion increased during Resurvey and the increase was marked in the MCC treatment.

With regard to the lactation period, about 17 to 33 per cent of the women were aware during the Bench Mark Survey that other women consume food in extra amounts. During Resurvey the proportion of such people was higher in all the four experimental treatments. The  $F$  value for the  $\bar{G}$  scores shows that the experimental programme had a differential impact.

*Lack of Financial Resources:* Finally, the project sought to identify those foods the people would like to eat during pregnancy and lactation but were not eating because of lack of financial resources. If such foods are identified, they may be provided through community action facilities (e.g., ANP kitchen gardens). From the point of view of the non-formal education classes, the efficacy of the programme could be gauged by the proportion of women who could report that they would like to eat extra amount during pregnancy/lactation at both points in time.

Item 4 in Panel B gives the results for pregnancy. It will be seen that a high proportion of the women were able to identify foods that they would like to eat in extra amount. The proportion increased slightly in MCC and MCC+FLIT treatments. Panel C, item 3 gives the results for lactation. Respondents who were able to identify foods during the Bench Mark Survey ranged from 18 to 33 per cent. In the Resurvey, the proportion of such people increased, especially in the MCC treatment, followed by MCC+FLIT.

The  $\bar{G}$  scores for the sub-total of Panels B and C show that the experimental programme had a differential impact on the women who participated in the programme. The mean changes in MCC and MCC+FLIT treatments were significantly different from that of the CONT.

*Breast Milk and Weaning Foods:* Generally in the rural areas children are breastfed as long as possible. This is to say, children are breastfed as long as the mother has breast milk or she becomes pregnant. Some studies have shown that children are breastfed up to 36 months of age. When a child is older than 6-9 months of age, breast milk alone is not sufficient to provide all the nutrients for the

sustenance and growth of a child. At this stage supplementary feeding is necessary. Very often children are fed small quantities of food eaten by adults and this is given more for the taste of that food rather than as supplementary food. Often efforts are not made to cook or provide weaning foods. So the weaning stage (toddler stage) is a vulnerable stage and many signs of malnutrition become manifest during this period. A high level of mortality is registered during this stage also.

The project sought to inculcate the practice of preparing and providing weaning foods, it was assumed that by providing knowledge and information about the need for weaning foods and the type of suitable food, people will change their practices. Further, it was observed that often rationalisations are built around the practice of not providing weaning foods. The project sought to change these rationalisations also. A few of these educational efforts were measured and are presented in Panel D.

*Semi-solid Foods:* It was observed that one of the rationalisations for not providing semi-solid foods to the weaning child was that before teething the semi-solid food cannot be digested. So introduction of semi-solids was postponed. Typically, in this area solids were introduced to children before semi-solids, although logically one would expect the reverse order. One of the non-formal education lessons was aimed at imparting knowledge that semi-solid foods can be given to children before teething. Panel D shows that the per cent respondents who had such knowledge during Bench Mark Survey ranged from 17 to 40. During the Resurvey in all the three action programmes, more people reported proper knowledge. The mean change scores show that the change was highest in the MCC treatment.

As a corollary to this, it was observed that many people believed that if semi-solid foods are fed to children before teething, they may vomit. The project sought to change this belief and tried to inculcate the knowledge that they can be digested. Panel D shows that during the Bench Mark Survey almost no respondent had the knowledge that semi-solid foods can be digested before teething. During Resurvey the proportion of those who had such knowledge increased in all the experimental treatments from 42 to 82 per cent. The increase in knowledge was very pronounced in the MCC treatment.

*Special Food for Toddlers:* Similarly, during the Bench Mark Survey the proportion of respondents who were aware of reasons for special food for toddlers was negligible. But during the Resurvey the



proportion increased and the increase was pronounced in MCC and MCC+FLIT treatments.

The next item goes one step further and shows the proportion of people who actually cooked the food. Here, again, it will be seen that the proportion increased and the increase was pronounced in MCC and MCC+FLIT treatments. It should be pointed out that any foods cooked with *balahar* which was supplied as part of the programme were excluded from consideration. Comparing this item with the other three knowledge items, it will be seen that the proportion who actually practise was lower than those who gain knowledge.

*Type of Foods Consumed during Pregnancy:* Perhaps it may be worthwhile considering the various types of food consumed in extra amount during pregnancy.

Table III shows that during the Bench Mark Survey period about 50 per cent of the women reported that they did not consume even one type of food in extra amount during pregnancy. About 75 per cent of the women did not consume two types of foods and about 90 per cent did not consume three types of foods. (It may be pointed out that our decision to code only the first three answers was justified by the fact that only a few – about 10 per cent – consumed three types of foods in extra amount during pregnancy.)

Similarly for the other two categories also, the percentage of women who reported that they did not consume different types of extra foods during Resurvey was much less than at the Bench Mark Survey period. This indicates that although there may be variations in the number of types of foods consumed in extra amount, a very high proportion of the women started to consume food in extra amount during pregnancy due to participation in the non-formal education classes.

The table also shows that during the Bench Mark Survey more than 10 per cent of the women reported that they consumed cereals, pulses and vegetables in extra amount. Other food groups were consumed in extra amount by a very small proportion only. During Resurvey in CONT, only meat in addition to the three mentioned above was reported to have been consumed in extra amount. On the other hand, in MCC and MCC + FLIT treatments except for fats and oils, all other food groups were consumed by more than 10 per cent of the women. This indicates that a balanced diet is consumed in extra amount rather than prestige foods like rice and meat.

*Type of Food consumed during Lactation:* Table IV shows that in

TABLE III: Per cent respondents who consumed food in extra amount during pregnancy in the Bench Mark (BM) and Resurvey (RS) by type of experimental treatment (Phase II)

Food consumed in extra amount during pregnancy		Experimental treatments			
		CONT (N=114)	FLIT (N=12)†	MCC (N=94)	MCC+FLIT (N=104)
1. Per cent who did not consume:					
a) even one type of food	BM	50.9	58.3	55.3	45.2
	RS	40.3	16.7	14.9	12.5
b) two types of foods	BM	77.2	83.3	77.6	75.0
	RS	61.4	50.0	26.6	32.7
c) three types of foods	BM	92.1	91.7	90.4	91.3
	RS	79.8	66.7	59.6	68.3
2. Per cent reported to consume:					
a) Cereals	BM	40.4	16.7	39.4	42.3
	RS	14.0	8.3	13.8	7.7
b) Pulses and nuts	BM	12.3	8.3	5.3	12.5
	RS	14.9	25.0	34.0	27.9
c) Meat, fish and eggs	BM	7.9	0.0	9.6	10.6
	RS	24.6	16.7	33.0	31.7
d) Milk and its products	BM	1.8	0.0	2.1	0.0
	RS	6.1	25.0	10.6	14.4
e) Vegetables	BM	7.9	8.3	15.6	17.3
	RS	38.6	41.7	47.9	57.7
f) Fruit	BM	0.9	16.7	2.1	2.9
	RS	7.0	33.3	34.0	26.0
g) Oils and fats	BM	5.3	8.3	2.1	2.9
	RS	0.9	8.3	4.3	3.8
h) Sugar	BM	3.5	0.0	0.0	0.0
	RS	14.0	8.3	21.3	17.3

Note: Percentages do not add up to hundred because of multiple answers.

†As the N is small, data should be interpreted with caution.

the Bench Mark Survey during the period of lactation only about 20 to 30 per cent of the women reported that they did not consume any food in extra amount. When compared with the period of pregnancy, this indicates that the women were aware of the need for extra food during lactation. Comparing the percentage of women who reported that they did not consume any food in extra amount during the lactation in the Bench Mark Survey and Resurvey in MCC and



TABLE IV: Per cent respondents who consumed food in extra-amount during lactation in the Bench Mark (BM) and Resurvey (RS) by type of experimental treatment (Phase II)

Food consumed in extra amount during lactation		Experimental treatments			
		CONT (N=114)	FLIT (N=12)†	MCC (N=94)	MCC+ FLIT (N=104)
1		2	3	4	5
1. Per cent who did not consume:					
a) even one food	BM	32.5	16.7	28.7	20.2
	RS	50.9	50.0	20.2	29.8
b) two foods	BM	48.2	25.0	44.7	47.1
	RS	71.1	66.7	37.2	49.0
c) three foods	BM	46.5	58.3	69.1	43.1
	RS	83.3	66.7	63.8	77.9
2. Per cent reported to consume:					
a) Cereals	BM	34.2	25.0	40.0	31.7
	RS	36.0	16.7	41.5	35.6
b) Pulses and nuts	BM	30.7	66.7	28.7	37.5
	RS	6.1	0.0	17.0	14.4
c) Meat, fish and eggs	BM	26.3	25.0	29.9	28.8
	RS	20.2	33.3	34.0	24.0
d) Milk and its products	BM	7.0	8.3	6.4	2.9
	RS	5.3	16.7	18.1	11.5
e) Vegetables	BM	32.5	50.0	37.2	35.6
	RS	17.5	41.7	34.0	36.5
f) Fruit	BM	0.9	8.3	8.5	8.7
	RS	4.4	0.9	25.5	15.4
g) Oils	BM	11.4	8.3	11.7	9.6
	RS	0.9	0.0	1.1	1.0
h) Sugar	BM	3.5	8.3	2.3	4.8
	RS	4.4	0.0	7.4	3.8

Note: Percentage do not add up to hundred because of multiple answers.

†As the N is small, data should be interpreted with caution.

MCC + FLIT treatments, it will be seen that not much change has taken place during the experimental period. Perhaps this may be due to ceiling effects.

That is, the women who can afford to consume food in extra amount were already consuming them before the start of the

experimental manipulation. So the percentage of the women who did not consume food in extra amount could not and did not go down.

Perhaps the effects of the non-formal education classes can be seen when the percentage of women who consume various foods are examined. Between the Bench Mark Survey and the Resurvey, the proportion of people who reported to have consumed milk and fruit increased. This could be due to participation in the classes.

*Food Taboos:* Food taboos during pregnancy and lactation is one of the few areas about which there is a great dearth of information. They differ from region to region; and within the same region, from sub-region to sub-region; within the same sub-region from caste to caste. Often an elaborate rationale is built around such taboos, which are generally handed down from generation to generation and are therefore deep-rooted.

Some of the food items that are regarded as taboos are very nutritious and such foods are readily and cheaply available. The project sought to change the attitude and knowledge of the women so that such nutritious foods are not lost to them during pregnancy and lactation, the period during which nutritious foods are essential. The earlier exploratory diet survey (see: Interim Report No. 2) identified about 12 items of food that were regarded as food taboos by various sections of the population in this area. These 12 items were used in the Bench Mark Survey and the women were asked whether they avoid eating those foods (if available) during pregnancy/lactation.

In addition, an open-ended question was used to ascertain foods that were regarded as taboos. If food taboos were mentioned, data on the period during which such foods were avoided and the reasons for avoiding them were also obtained. This information was made available to those who were in charge of the nutrition lessons and special lessons geared to changing knowledge and attitude were written up.

Table V shows that a very high proportion of the women did not in fact regard most of the listed food items as taboo during the Bench Mark Survey. Except for eggs, amaranthus, brinjal, pumpkin and papaya, almost four-fifths of the population do not regard them as taboo. In general, more people regard any of these selected food items as taboo during lactation rather than during pregnancy.

The last but one row of the table shows that the magnitude of change that took place after the experimental period was very small. In spite of the fact that systematic efforts directly relevant to the



TABLE V: Per cent women who did not regard selected food items as 'taboo' during pregnancy, lactation during Bench Mark (BM) and Resurvey (RS) and mean change scores ( $\bar{G}$ ) by type of experimental treatments (Phase II)

Selected food items	Experimental treatments during lactation					Experimental treatments during pregnancy				
	CONT (N=114)	FLIT (N=12) <sup>†</sup>	MCC (N=94)	MCC+FLIT (N=104)		CONT	FLIT	MCC	MCC+FLIT	
1	2	3	4	5	6	7	8	9		
1. Buffalo milk	BM 80.7	83.3	80.9	67.3	59.6	75.0	62.8	61.5		
	RS 78.1	91.7	91.5	92.3	70.2	66.7	73.4	80.8		
	$\bar{G}$ -0.03*	0.08	0.11	0.25	0.11	-0.08	0.11	0.19		
2. Chicken/Meat	BM 81.6	83.3	90.4	81.7	60.5	75.0	64.9	69.2		
	RS 87.7	83.3	91.5	91.3	83.3	58.3	83.0	78.8		
	$\bar{G}$ 0.06	0.0	0.01	0.10	0.23	0.17	0.18	0.10		
3. Eggs	BM 78.1	83.3	81.9	82.7	34.2	41.7	43.6	60.6		
	RS 81.6	91.7	91.5	96.2	61.4	66.7	69.1	75.0		
	$\bar{G}$ 0.04	0.08	0.10	0.14	0.27	0.25	0.26	0.14		
4. Pulses	BM 97.4	91.7	100.0	99.0	78.9	75.0	83.0	88.5		
	RS 91.2	100.0	97.9	99.0	86.0	100.0	90.4	97.1		
	$\bar{G}$ -0.06	0.08	-0.02	0.0	0.07	0.25	0.07	0.09		
5. Amaranthus	BM 93.0	83.3	90.4	86.5	36.8	33.3	40.4	58.7		
	RS 69.3	75.0	90.4	90.4	62.3	58.3	78.7	76.0		
	$\bar{G}$ -0.24*	-0.08	0.0	0.04	0.25	0.25	0.38	0.17		
6. Brinjal	BM 98.2	83.3	95.7	99.0	65.8	33.3	52.1	76.9		
	RS 96.5	100.0	98.9	95.2	88.6	75.0	91.5	86.5		
	$\bar{G}$ -0.02*	0.17	0.03	-0.04	0.23*	0.42	0.39	0.10		

(Contd.)

TABLE V (Contd.)

7. Water gourd	BM	86.0	100.0	85.1	96.2	61.4	83.3	66.0	71.2
	RS	90.4	91.7	93.6	92.3	76.3	75.0	81.9	77.9
	$\bar{G}$	0.04	-0.08	0.09	-0.04	0.15	-0.08	0.16	0.07
8. Bottle gourd	BM	95.6	100.0	94.7	96.2	80.7	91.7	83.0	81.7
	RS	96.5	100.0	100.0	100.0	93.9	100.0	96.8	92.3
	$\bar{G}$	0.01	0.00	0.05	0.04	0.13	0.08	0.14	0.11
9. Pumpkin	BM	44.7	58.3	44.7	31.7	14.0	25.0	23.4	22.1
	RS	47.4	50.0	64.9	51.0	38.6	41.7	48.9	43.3
	$\bar{G}$	0.03*	-0.08	0.20	0.19	0.25	0.17	0.26	0.21
10. Papaya	BM	22.8	25.0	26.6	22.1	21.1	25.0	25.5	24.0
	RS	36.8	33.3	63.8	54.8	36.0	41.7	63.8	56.7
	$\bar{G}$	0.14*	0.08	0.37	0.33	0.15*	0.17	0.38	0.33

\*F value significant at .05 level.

\*\* t-value of the difference between that score and that of control is significant at .05 level.

†As the N is small, data should be interpreted with caution.



people based on their stated reasons were made in the classes, the change is small indeed. This shows that even with systematic and concentrated efforts, deep-seated culturally defined taboos are difficult to change.

*Information on Potential Facilities:* A third area in which the project sought to give information and knowledge was with regard to facilities for supplementing the day-to-day diet. It should be emphasised that the project sought to give only information on these facilities and not to provide the facilities themselves to the women. For example, the women were told how to raise poultry, the financial gains that can accrue by having poultry, and eggs and meat from poultry that could provide much-needed nutrients. No attempt was made to provide free of cost or at nominal price eggs or chicken to the participants. So whatever changes were observed in this area should be seen as changes that occurred when knowledge and information were provided.

Table VI shows that about one-fourth of the women had kitchen gardens and poultry during the Bench Mark Survey. In MCC and MCC + FLIT treatments, another 10 to 15 per cent had kitchen gardens and about 40 per cent more people had poultry during Resurvey. Whether the produce from these two were sold to buy other essential commodities or consumed by the family members, it can be safely asserted that the nutrition level of the food consumed by these people was higher at the Resurvey period than at the Bench Mark period.

With regard to milch animals (mostly cows) about 40 per cent of the people had them at Bench Mark time. At Resurvey time the per cent who had milch animals did not change drastically. This may be because of the high initial investment required to own milch animals which perhaps most of the people in the study area could not afford.

Taking all the three tables (IV, V and VI) together, one can safely say that the knowledge and attitude in the area of nutrition improved to a great extent as a result of participating in the non-formal education classes. Observing that such knowledge was partly put into practice, one can venture to say that these women are on the road to health and prosperity.

TABLE VI: Per cent of respondents with facilities for supplementing diet during Bench Mark (BM) and Resurvey (RS) and mean change scores ( $\bar{G}$ ) by type of experimental treatments (Phase II)

Facilities for supplementing diet		Experimental treatments			
		CONT (N=114)	FLIT (N=12) <sup>†</sup>	MCC (N=94)	MCC+FLIT (N=104)
1		2	3	4	5
1. Have a kitchen garden	BM	23.7	33.3	21.3	20.2
	RS	19.3	50.0	30.9	34.6
	$\bar{G}^*$	-0.20	0.17	0.10	0.14
2. Have poultry	BM	24.6	50.0	29.8	24.0
	RS	44.7	66.7	74.5	64.4
	$\bar{G}^*$	0.20	0.17	0.45	0.40
3. Have milch animals	BM	41.2	33.3	42.6	38.5
	RS	39.5	41.7	52.1	38.5
	$\bar{G}$	-0.02	0.08	0.10	0.00
Total	$\bar{G}^*$	0.14	0.42	0.64**	0.55**
Total Standardised Score	$\bar{G}^*$	0.05	0.14	0.21	0.18

\* F value significant at .05 level.

\*\* 't' value of the difference between that score and that of control is significant at .05 level.

<sup>†</sup> As the N is small, data should be interpreted with caution.

### Knowledge and Attitude towards various Family Planning Techniques

Population control has been one of the basic national policies of the Government of India. Through various agencies, both governmental and voluntary, population control has been very actively propagated, but such efforts have not yielded the desired degree of success. One of the major reasons for this is that governmental agencies rely mainly (or almost exclusively) on terminal methods of family planning. Such methods, although virtually foolproof, are not adopted by many because they are terminal. In addition, due to ignorance, many people have wrong notions about the physiological changes that take place due to sterilisation and associate those changes with 'undesired' consequences.

It is assumed that if proper and adequate knowledge is provided,



the people will be able to make rational decisions regarding adoption of family planning techniques. Further, it is also assumed that information should be provided about most of the available techniques of family planning rather than about one or two methods only. This will facilitate people to opt for the technique of their choice after rationally examining the available methods. The project, through its non-formal education classes, sought to provide such knowledge. Table VII presents the results.

The table shows that proper knowledge about any of the five techniques of family planning was virtually absent during the Bench Mark Survey. The favourable attitude towards the techniques (measured as behavioural intentions) were also negligible. After the experimental treatment, both knowledge and attitude registered positive changes in MCC and MCC + FLIT treatments. Between the two, gain in attitude was more pronounced than gain in knowledge.

In general, the changes registered for women in FLIT were similar to those in CONT where no classes were conducted. Perhaps, one can speculate reasons for this. The FLIT centres were manned by school teachers who were superannuated. It may be possible that such elderly people were reluctant to teach family planning techniques. Even if they taught the subject, they did so without much conviction.

*Fear of Forcible Sterilisation:* It should be pointed out that the fear of forcible sterilisation was widespread in this area. As discussed in Chapter XV, a portion of sample attrition was due to this fear. Further, in the minds of the people, sterilisation has a bad connotation and was associated with unwanted side-effects. Yet Table VII shows that both attitude and knowledge about family planning techniques registered a substantial change.

Perhaps two reasons for this may be pointed out. First, in the non-formal education classes, family planning was not approached from the point of view of family limitation but from the point of view of responsible parenthood. Perhaps the women were able to see the logic behind such an approach and so were receptive to the messages in the classes. Second, lessons on family planning were not conducted at the beginning of the project. They were conducted during the middle when the Health Educators had gained the confidence of the women. It is possible when a person, who takes care of the health and well-being of children, talks about family planning techniques, the women may be more receptive to those messages.

TABLE VII: Knowledge and attitude towards various contraceptive techniques: Per cent who gave correct answer during Bench Mark (BM) and Resurvey (RS) and mean change scores by type of experimental treatments (Phase II)

Knowledge and attitude towards contraceptive techniques		Experimental treatments				
		CONT (N=114)	FLIT (N=12)†	MCC (N=94)	MCC+FLIT (N=104)	
1		2	3	4	5	
1. Tubectomy:	Knowledge	BM	5.3	0.0	9.6	3.8
		RS	2.6	0.0	40.4	29.8
		$\overline{G}^*$	-0.03	0.0	0.31	0.26
	Attitude	BM	21.1	33.3	24.5	24.0
		RS	33.3	66.7	78.7	75.0
		$\overline{G}^*$	0.12	0.33	0.54	0.51
2. Vasectomy:	Knowledge	BM	1.8	0.0	2.1	0.0
		RS	2.6	0.0	31.9	20.2
		$\overline{G}^*$	0.01	0.0	0.30	0.20
	Attitude	BM	7.9	0.0	10.6	4.8
		RS	21.1	33.3	55.3	59.6
		$\overline{G}^*$	0.13	0.33	0.45	0.55
3. IUD:	Knowledge	BM	0.0	0.0	0.0	1.0
		RS	0.0	16.7	13.8	9.6
		$\overline{G}^*$	0.00	0.17	0.14	0.09
	Attitude	BM	1.8	8.3	1.1	1.9
		RS	5.3	33.3	33.0	29.8
		$\overline{G}^*$	0.04	0.25	0.32	0.28
4. Condom:	Knowledge	BM	0.0	0.0	1.1	1.0
		RS	1.8	8.3	34.0	27.9
		$\overline{G}^*$	0.02	0.08	0.33	0.27
	Attitude	BM	0.9	0.0	0.0	1.0
		RS	2.6	16.7	23.4	26.0
		$\overline{G}^*$	0.02	0.17	0.23	0.25

(Contd.)



TABLE VII (Contd.)

1		2	3	4	5
5. Pills:					
Knowledge	BM	0.0	0.0	0.0	1.0
	RS	2.6	8.3	26.6	9.6
	$\bar{G}^*$	0.03	0.08	0.27	0.09
Attitude	BM	1.8	0.0	1.1	4.8
	RS	11.4	50.0	55.3	47.1
	$\bar{G}^*$	0.10	0.50	0.54	0.42
Total:					
Knowledge	$\bar{G}^*$	0.03	0.33**	1.34**	0.90**
Attitude	$\bar{G}^*$	0.40	1.58**	2.09**	2.01**
Total Score	$\bar{G}^*$	0.43	1.92**	3.43**	2.91**
Total Standardized Score	$\bar{G}^*$	0.04	0.19**	0.34**	0.29**

\* F value significant at .05 level.

\*\* 't' value of the difference between that score and that of control is significant at .05 level.

† As the N is small, data should be interpreted with caution.

### Achievement in Literacy Skill

One of the major assumptions of the project was that rural women will be interested in acquiring literacy skill if literacy lessons contain messages dealing with maternal and child care. Further, it was also assumed in the Project Design that 'functional literacy training in itself will make a substantial difference and may, in addition, be required as a necessary but not sufficient adjunct of Mother Child Centre programmes if the benefits are to be sustained'. In other words, the functional literacy skill was expected to produce an interaction effect and introduce a permanent learning skill. So, it is worth while examining the level of achievement in literacy skill attained by the women in the programme.

*Functional Literacy:* It may be recalled that functional literacy was taught in two of the four experimental treatments, namely, FLIT and MCC + FLIT. Between these two treatments, given the two assumptions stated above, the level of achievement in literacy skill of women in MCC + FLIT was expected to be higher than that of the

women in FLIT treatment. The relationship for all the four treatments could be symbolically stated as:

$$\bar{G}_{\text{CONT}} = \bar{G}_{\text{MCC}} < \bar{G}_{\text{FLIT}} < \bar{G}_{\text{MCC+FLIT}}$$

Table VIII gives the levels of achievement in various aspects of literacy skill at the time of the Bench Mark and the Resurvey and the mean changes that took place during the experimental period. It will be seen that the level of achievement at the Bench Mark Survey was more or less similar for all the four experimental treatments. During the Resurvey, both FLIT and MCC + FLIT showed increase in the level of achievement, the former substantially more than the latter. The hypothesis that MCC + FLIT will register a higher level of achievement was not supported by data. When the three components of literacy skill were compared, it could be seen that the achievement in reading skill was the highest, followed by achievement in arithmetic

TABLE VIII: Measures of achievement in literacy skill at the time of Bench Mark (BM) and Resurvey (RS) and mean change scores ( $\bar{G}$ ) by experimental treatments (Phase II).

Measures of achievement in literacy skill		Experimental treatments			
		CONT (N=114)	FLIT (N=12) <sup>†</sup>	MCC (N=94)	MCC+FLIT (N=104)
1		2	3	4	5
1. Reading achievement	BM	0.59	2.33	0.60	0.47
	RS	0.19	42.25	1.20	8.38
	$\bar{G}^*$	-0.39	39.90	0.60	7.90
2. Writing achievement	BM	1.32	5.33	1.11	0.29
	RS	0.00	12.33	0.35	0.95
	$\bar{G}^*$	-1.32	7.00	-0.76	0.66
3. Arithmetic achievement	BM	0.24	2.08	1.06	0.10
	RS	0.00	32.42	1.23	3.05
	$\bar{G}^*$	-0.24	30.33	0.17	2.95
4. Total/Literacy achievement	BM	0.75	3.33	0.95	0.28
	RS	0.06	28.67	0.92	3.97
	$\bar{G}^*$	-0.68	25.33	-0.03	3.69

\*  $F$  value significant at .05 level.

<sup>†</sup> As the  $N$  is small, data should be interpreted with caution.



and writing skills.

In order to provide a more substantive interpretation of the achievement in literacy skill, Table IX gives selected standards of reference for the scores obtained during the Resurvey. Panel D shows that with regard to total/literacy achievement the mean for FLIT is about nine times larger than that of the mean for MCC + FLIT treatment. Both in FLIT and MCC+FLIT about one-fourth of the women obtained zero scores. It may be recalled that only those who attended 25 per cent or more of the classes were eligible for Resurvey. Even among those, about one-fourth scored zero. This indicates that for some, even attending classes did not result in any gain in literacy skill.

In order to facilitate the level of achievement from the normative (i.e., grade in school) point of view, selected relevant data are presented in Table IX. In view of the fact that validation of the test was conducted in the rural schools during March (i.e., at the end of the academic year) the data may be interpreted as equivalent of the completed grade in school. In the FLIT treatment 33.3 per cent were at or above the mean of grade one; 17 per cent at grade two and 8.3 per cent at the mean of grade three. On the other hand in the MCC+FLIT treatment only 5 per cent were at or above the mean of grade one and only 1 per cent at the mean of grade two.

*Low Level of Achievement:* Examining the normative level it can be stated that the achievement was low in both the treatments, especially in view of the fact that the participants were adults and attended classes for about 11 months. An obvious cause for this low level of achievement may be that the primer may need substantial revision and testing before finalising it. Perhaps the motivation of the women to become literate was low. Unless the motivation is raised to a higher level, such efforts are bound to fail. In view of the fact that the level of achievement of most women was at or below the level of grade 1, one may expect these women to lapse back into illiteracy very soon.

*Reasons for Low Level:* When compared with the achievement of women in the FLIT treatment, the achievement of women in the MCC+FLIT treatment was low. Perhaps a few possible reasons for this may be outlined. First, in MCC+FLIT treatment, roughly one-half of the class time was spent on literacy. The other half was spent on discussion and demonstration of the non-formal lessons. Although non-formal lessons were taught in FLIT centres also, very little time was spent on them.

TABLE IX: Levels of ability in literacy skill by experimental treatments (Phase II - Resurvey)

Measures of ability in literacy skill	Experimental treatments			
	CONT (N=114)	FLIT (N=12)†	MCC (N=94)	MCC+FLIT (N=104)
1	2	3	4	5
<b>A. Reading ability</b>				
1. Mean	0.19	42.25	1.20	8.38
2. Standard deviation	1.55	40.07	8.32	18.83
3. % with zero score	98.2	16.7	95.7	28.8
4. % scored 50% and above	0.0	42.4	1.1	5.0
5. % at or above mean for Class I	0.0	42.4	1.1	5.0
6. % at or above mean for Class II	0.0	25.0	0.0	2.9
7. % at or above mean for Class III	0.0	16.7	0.0	1.0
<b>B. Writing ability:</b>				
1. Mean	0.0	12.33	0.35	0.95
2. Standard deviation	0.0	25.48	3.40	6.03
3. % with zero score	100.0	75.0	98.9	97.1
4. % scored 50% and above	0.0	16.7	0.0	1.0
5. % at or above mean for Class I	0.0	16.7	0.0	0.0
6. % at or above mean for Class II	0.0	16.7	0.0	0.0
7. % at or above mean for Class III	0.0	0.0	0.0	0.0
<b>C. Arithmetic ability:</b>				
1. Mean	0.0	32.42	1.23	3.04
2. Standard deviation	0.0	48.43	11.95	15.00
3. % with zero score	100.0	50.0	98.9	87.5
4. % scored 50% and above	0.0	33.3	1.1	2.9
5. % at or above mean for Class I	0.0	33.3	1.1	2.9
6. % at or above mean for Class II	0.0	33.3	1.1	2.9
7. % at or above mean for Class III	0.0	16.7	1.1	2.0
<b>D. Total/Literacy ability:</b>				
1. Mean	0.06	28.67	0.92	3.97
2. Standard deviation	0.50	33.46	7.70	11.53
3. % with zero score	98.2	25.0	96.8	30.8

(Contd.)



TABLE IX (Contd.)

1	2	3	4	5
4. % scored 50% and above	0.0	33.3	1.1	2.9
5. % at or above mean for Class I	0.0	33.3	1.1	4.8
6. % at or above mean for Class II	0.0	16.6	1.1	1.0
7. % at or above mean for Class III	0.0	8.3	0.0	0.0

† As the N is small, data should be interpreted with caution

Second, the number of women attending the MCC + FLIT centres for lessons ranged from 10 to 20, whereas in FLIT centres, the range was 2 to 5. So in FLIT centres a greater degree of individual attention by the teacher was possible than in MCC + FLIT centres. Third, the teachers in the MCC + FLIT treatments were Auxiliary Nurse Midwives (ANM) who were trained in the medical field. On the other hand, the teachers in FLIT centres were trained elementary school teachers. Although both were given special training for teaching functional literacy, the professional background and formal training of the latter perhaps were more conducive for teaching literacy than that of the former. Perhaps one can conclude that if functional literacy classes are to be an adjunct of maternal child care centres, the role of the ANM as a functional literacy teacher should be reconsidered.

One may raise the question as to whether the social background and socio-psychological milieu of the women had an influence on the literacy skill achieved. To explore this, the mean total/literacy skill by various factors was computed and is presented in Table X. It will be seen from the table that in MCC + FLIT the women from upper castes attained a much higher level of literacy skill than the other two caste groups. The type of house in which a respondent was living can be taken as an indicator of her economic status. In general the table shows that the higher the economic level, the higher was the achievement. It is interesting to note that the women who live in huts also achieved as much as those who lived in pucca houses. Perhaps the former were highly motivated.

The respondents were classified into two groups according to their husbands' literacy level. The women whose husbands were literate had much higher levels of achievement than the women whose husbands were illiterate.

TABLE X: Mean total 3-R scores (at Resurvey) by selected variables – FLIT and MCC+FLIT treatments (Phase II)

Selected variables	FLIT (N=12)†	MCC+FLIT (N=104)
1	2	3
1. Caste: Upper	—	21.9
Backward	36.2	3.7
Scheduled	—	4.3
2. Type of houses: Hut	—	5.8
Kutchha	22.9	1.4
Mixed	40.7	1.4
Pucca	43.5	6.8
3. Husband: Illiterate	29.8	2.8
Literate	49.1	17.1
4. Age of respondent: Young	36.5	5.1
Old	35.3	5.6
5. Family type: Nuclear	59.3	5.9
Joint	24.7	5.0
6. Aspires son to be illiterate:	29.0	2.1
to be literate:	46.3	11.6
7. Will not borrow for son's education:	13.8	1.8
Will borrow for son's education:	40.7	6.5

† As the N is small, data should be interpreted with caution.

Two indicators of familial situation, namely, age of respondent and type of family, were also tested. Although younger women did not achieve more than older women, women from nuclear families in FLIT scored more than those from joint families. For the other two variables regarding son's education the results are in the expected direction.

In order to examine whether the women's behaviour and performance in the classroom had any association with literacy skill, the teachers were requested to rate the participants on several variables. The results are presented in Table XI. As the sample size was small for FLIT treatment, no attempt will be made to interpret those data.

The behaviour and performance of the women in terms of whether they attend classes without much persuasion, whether they were regular in attending classes and whether they participated in the class discussions were all positively associated. Paradoxically, the women who were reported to have stayed in the class for the entire duration



TABLE XI: Mean total 3-R scores (at Resurvey) by teacher's rating of the respondent - FLIT and MCC+FLIT treatments (Phase II)

Teacher's rating			FLIT (N=12) <sup>†</sup>	MCC+FLIT (N=104)
1.			2	3
1.	Attends classes	No (N:2/32)	28.8	3.8
	without much persuasion	Yes (N:10/72)	37.7	6.1
2.	Whether regular in attending classes	No (N:3/28)	13.9	4.3
		Yes (N:9/76)	43.6	5.8
3.	Whether comes to classes in time	No (N:0/24)	—	5.0
		Yes (N:12/84)	19.5	5.5
4.	Whether stays in the class for the entire duration of the class	No (N:0/8)	0.0	10.9
		Yes (N:12/96)	39.5	4.9
5.	Whether participates in the discussions	No (N:3/43)	8.9	3.2
		Yes (N:9/61)	45.3	6.9
6.	Rating of the participant	Low (N:1/35)	12.7	3.4
		Fair (N:6/40)	12.2	3.8
		Good (N:5/29)	69.7	10.1
7.	Whether drinks and comes to classes	Yes (N:1/14)	0.0	7.5
		No (N:11/90)	39.5	5.1

*Note:* The first figure within parentheses refers to the N for FLIT and the second to the MCC+FLIT treatment.

<sup>†</sup> As the N is small, data should be interpreted with caution.

scored less in literacy achievement than those who were reported to have not stayed for the entire period.

The rating of the participant as low, fair and good was positively associated with literacy skill. This perhaps reflects the fact that as the classes were small, the teachers had more intimate contact with the women and so were able to judge their performance.

### Global Measures of Change

It is assumed that when rural illiterate women participate in non-formal education and/or functional literacy classes, their mental horizons may widen, and their thinking in other spheres of life may be stimulated. If so, it can be expected that they will be aware of many other useful things that go on around them, participate in other stimulating activities and may develop higher aspirations not for themselves alone but also for their children. The research design

sought to measure the changes in these areas and tried to document them.

Towards this purpose it is assumed that between non-formal education classes and functional literacy classes, the latter may produce more change than the former. So the postulated form of relationship among the four experimental groups was that FLIT and MCC + FLIT will show a greater degree of change than MCC and CONT. Symbolically,

$$\bar{G}_{\text{CONT}} < \bar{G}_{\text{MCC}} < \bar{G}_{\text{FLIT}} < \bar{G}_{\text{MCC+FLIT}}$$

*Knowledge about Land Ownership and Taxation:* Table XII shows

TABLE XII: Selected global measures of change by type of experimental treatments (Phase II) (in percentages)

Selected global measures of change		Experimental treatments			
		CONT (N=114)	FLIT (N=12)†	MCC (N=94)	MCC+FLIT (N=104)
1		2	3	4	5
<b>A. Knowledge about land owned/house tax demanded:</b>					
1. Ability to report amount of land owned	BM	55.3	75.0	59.6	57.7
	RS	80.7	75.0	94.7	92.3
	$\bar{G}$	0.25	0.00	0.35	0.35
2. Ability to report the amount of house tax that was demanded by the panchayat	BM	28.9	408.3	28.7	30.8
	RS	26.3	25.0	30.9	51.9
	$\bar{G}^*$	-0.03	0.17	0.02	0.21
Sub-total	$\bar{G}^*$	0.23	0.17	0.37	0.56
<b>B. Participation in mass media:</b>					
1. Frequency of visit to cinema@	BM	0.78	0.92	0.73	0.73
	RS	0.57	0.75	0.83	0.74
	$\bar{G}^*$	-0.21	-0.17	0.10	0.07
2. Frequency of listening to radio@	BM	1.45	1.58	1.41	1.09
	RS	0.31	0.75	0.74	0.70
	$\bar{G}^*$	-2.63	-6.50	-3.10	-3.01
Sub-total	$\bar{G}^*$	-2.84	-6.67	-3.00	-2.94

(Contd.)



TABLE XII (Contd.)

1		2	3	4	5
C. Educational aspiration for children:					
1. Mean years of schooling aspired for son	BM	2.94	7.25	3.84	3.71
	RS	5.25	6.17	5.44	4.37
2. Willing to borrow money for son's education	BM	53.5	50.0	56.4	46.2
	RS	71.9	83.3	77.7	76.9
	$\bar{G}$	0.18	0.33	0.21	0.31
Total score.	$\bar{G}^*$	-2.43	-6.17	-2.42	-2.08
Total standardised scores	$\bar{G}^*$	-0.49	-1.23**	-0.48	-0.42
Grand Total standardised scores for all 7 scales	$\bar{G}^*$	-0.21	-0.70	0.48**	0.38**

\* F value significant at .05 level.

\*\* 't' value of the difference between that score and that of control is significant at .05 level.

@Coded as: never 0; once in a while 1; sometimes 2; often 3.

†As the N is small, data should be interpreted with caution.

that the proportion of women who could report the amount of land owned by the family increased between the Bench Mark Survey and Resurvey. Examining the  $\bar{G}$  scores for all the four experimental treatments (and the insignificant *F* value) it can be seen that the experimental treatments did not have a differential impact. On the other hand, with regard to the amount of panchayat house tax, the change follows the postulated relationship.

Panel B gives the degree of participation in mass media. The means show that during Bench Mark Survey the women visited cinema once in a while within the last three months. During Resurvey reference period (i.e., three months preceding the survey) the frequency of visits increased slightly in MCC and MCC+FLIT treatments. Although one should not infer that the women in these two treatments increased their participation in mass media, this perhaps indicates a slightly increased urban contact. As described elsewhere, for referral services the participants were advised or taken to the PHC or the Government Headquarters Hospital. It is possible that a few could have stayed back and visited a cinema house. In such an event, it is possible for the

women to develop a more favourable attitude towards utilising services in the urban centres.

On the other hand, the reported frequency of listening to the radio has decreased between Bench Mark and Resurvey reference periods. Listening to the radio was operationally defined as sitting down and listening and not casual listening as they move about in the village. One possible explanation for the decrease may be that the community radio sets that were in working condition during the Bench Mark Survey period were not so during the Resurvey period.

*Aspiration for Children:* Panel C gives two indicators of educational aspiration for children. The level of education aspired for the son increased during the interval between the Bench Mark Survey and Resurvey. The increase is discernible for CONT also. So, the increase in the level of aspiration cannot be attributed to the experimental manipulation.

Similarly, the reported willingness to borrow money to educate sons showed some increase between the two surveys. But the insignificant  $F$  value shows that there was no differential impact among the treatments.

It should be pointed out that the educational aspiration questions specified that the son's education was involved. As many people in this area believed that girls need not be educated, the question specified sons and not children's education. The data show that although there is an increase in the level of aspirations, it was common for all treatments.

Table XII gives the results for three types of global measures of change. The change that has taken place in only one can be interpreted as due to the experimental treatment.

### **Child Mortality during the Study Period**

It may be recalled that one of the major objectives of the project was to reduce child mortality through the delivery of a package of integrated services of education, health and nutrition. Unlike change in knowledge and attitude, child mortality is a stable and objective indicator of the effectiveness of the services package. Given the formulation of the four experimental treatments and the quantum of package of services in each of the treatments, it was expected that the magnitude of child mortality should be least in MCC+FLIT and maximum in CONT. Specifically, the hypothesised relationship was:



## CONT &gt; FLIT &gt; MCC &gt; MCC+FLIT

From Table XIII it will be seen that during the period of study in CONT where normal governmental health services were available, 16.8 per cent of the women lost at least one child. Whereas in MCC 8.4 per cent and in MCC+FLIT 7.7 per cent of the women lost at least one child. Although the differences between MCC and MCC+FLIT was negligible, the data reveal that package of services was able to reduce child mortality by one-half.

TABLE XIII: Child mortality between Bench Mark and Resurvey by experimental treatments

Aspects of child mortality	Experimental treatments			
	CONT (N=114)	FLIT (N=12)	MCC (N=94)	MCC+FLIT (N=104)
1. Per cent women who lost at least one child	16.8 (19)	8.3 (1)	8.4 (8)	7.7 (8)
2. Sex of the child which died:				
(a) Male	26.3 (5)	100.0 (1)	50.0 (4)	50.0 (4)
(b) Female	73.7 (14)	0.0 (0)	50.0 (4)	50.0 (4)

Many researchers have drawn pointed attention to the cultural preferences for male children rather than female children in India. Partly because of this, more adequate food and health care is often provided to male children than to female children. The table shows that in CONT a higher number of female children than male children died during the study period. In contrast to this, in MCC and MCC+FLIT the numbers were equal. This shows that the package of services were successful in eliminating mortality due to neglect of female children.

### Other Possible Sources of Change

The preceding analysis has clearly demonstrated that the experimental manipulation had a definite differential impact on the women who

were in different experimental treatments. The analysis implicitly assumed that the change was due to participation in the experimental treatment. It is possible that the change may be due to other factors, i.e., factors other than the experimental manipulation. We now examine such a possibility.

It was hypothesised that a few other factors like socio-economic status, familial situation and demographic characteristics could at least partially account for the change that was measured. It may be recalled that the first stage of sampling procedure adopted was to select the village controlled for several contextual variables like ethnicity, religion, population size and proximity to urban areas. Hence, those variables were excluded for this analysis.

### Variables

*Socio-economic Status:* Three sets of factors were hypothesised to be the possible sources of change that were observed. They are: (1) socio-economic status; (2) family situation; and (3) demographic characteristics. As indicators of socio-economic status, three variables were selected. They are: (a) caste groups (coded as: scheduled castes 1, backward castes 2, upper castes 3) in which the various *jati* or sub-castes were grouped into three categories according to the classification followed by the Government of Andhra Pradesh; (b) the type of house in which the respondent was living at the time of Bench Mark (classified and coded as: hut 1, katcha 2, mixed 3, pucca 4); and (c) husband's education (coded as: illiterate 0, literate 1). All these three indicators were hypothesised to be positively associated with measured change.

*Family Situation:* Three indicators of family situation were selected. They were: (a) total number of members in the family; (b) type of family (coded as: nuclear 1, others 0); and (c) second wife of her husband and the first wife died during pregnancy or delivery (coded as 1 and all others 0).

Perhaps a brief explanation is necessary for the last variable. It may be recalled that most of the lessons of the non-formal education classes centred round health during pregnancy and lactation. It is possible that women who were second wives (if the first wife had died during pregnancy or child birth) may be more interested in the lessons purely out of self-interest. It is assumed that such women may register more change than others who did not have such experience. It is



hypothesised that the first indicator was negatively associated and the other two were positively associated with measured change.

*Demographic Characteristics:* Four variables dealing with demographic characteristics were also included in the analysis. They are: (a) age of respondent at the time of Bench Mark Survey; (b) total number of pregnancies experienced by the respondent up to the time of Bench Mark Survey; (c) total number of children alive at the time of Bench Mark Survey; and (d) total number of pregnancy wastage. It is defined as the sum of abortions, miscarriages and still-births. It may be noted that the demographic characteristics selected for analysis are presumed to be related to maternal and child health. Table XIV gives the distribution of these variables.

### **Dependent Variables**

The earlier analysis made use of five scales of measured change, namely health care, nutrition, family planning, global measures of change and literacy. Except literacy, all the other four areas (or dimensions) were covered in the non-formal education classes. The tables that presented data provided Total Standardised Scores which were defined as the total score for any scale obtained by an individual divided by the number of items in that scale. For this analysis, all the standardised scores for the four scales were summed and presented as Grand Total of Standardised Scores or simply Total Scores.

The initial analysis made use of all the Total Standardised Scores for each of the four scales in addition to the Grand Total. Since the computed values for all these five dependent variables were similar and the interpretations were identical, only the Grand Total is presented for the sake of clarity and parsimony.

### **Mode of Analysis**

The research question that guided the analysis was: Are there any sources, other than (or in addition to) participation in the experimental manipulation, which can account for the changes that were observed? First, it may be recalled that there were four experimental treatments. Although an ordering of those four treatments was assumed at the time of the design of the study for most of the variables, the earlier analysis showed that the assumed ordering did not hold in most cases. So the four treatments cannot be conceptualised as four levels

TABLE XIV: Percentages or means of variables included to examine other possible sources of change (N = 324)

	Percentages or means
1. Caste: a) Scheduled Caste	15.4
b) Backward Caste	68.2
c) Upper Caste	16.4
2. Type of house: a) Hut	16.7
b) Kutcha	13.9
c) Mixed	4.9
d) Pucca	64.5
3. Husband: per cent literate	1.5
4. Total family members ( $\bar{X}$ )	7.5
5. Type of family: per cent nuclear	48.2
6. Second wife (per cent)	5.2
7. Age of respondent ( $\bar{X}$ )	26.5
8. Total number of pregnancies ( $\bar{X}$ )	4.2
9. Total pregnancy wastage ( $\bar{X}$ )	1.9
10. Total children alive ( $\bar{X}$ )	3.5

of the same variable. They should appropriately be conceptualised as four separate categorical variables only. Second, the research question is a search for factors other than the experimental manipulation as the source for change. Hence, the analysis should make use of a technique that can handle unordered categorical variables and one or more variables that may be in an interval scale in a multivariate scheme.

The analysis makes use of dummy variable or binary variable technique.<sup>1</sup> A binary variable is one which takes on one of two values 0 or 1. In this technique each category is designated as one variable. An individual is given a score of '1' if she participated in an experimental treatment and all others are given a score of '0' for that variable. The technique also requires that one of the categories is omitted from analysis and all computed values are with reference to this omitted category. As one of our major interests is to examine whether the women in the other three categories showed more measured change than the CONT, that category was used as the omitted or reference category. The following scheme gives the scores assigned to the women in four experimental treatments for all the four variables.

The scheme shows that the women in the FLIT group were given a score of '1' for the variable number 2 and the women in all other treatments were given a score of '0' for that variable. Similarly women



in MCC were given a score of '1' for variable number 3 and all others were given a score of '0' for that variable. Likewise women in MCC+FLIT were given a score of '1' for variable number 4.

Type of experimental treatments	Dummy variable number			
	One* $X_1$	Two $X_2$	Three $X_3$	Four $X_4$
CONT	1	0	0	0
FLIT	0	1	0	0
MCC	0	0	1	0
MCC+FLIT	0	0	0	1

\*Dummy variable No. 1 representing the control group is dropped.

### Interpretation

The coefficients that were computed were adjusted means and they are presented as deviations from the mean for the CONT group. For example, when the three categorical variables (dummy or binary variables) were entered in a regression equation, the following model can be estimated.

$$\hat{Y} = \alpha + \beta X_2 + \beta X_3 + \beta X_4$$

In such a model,  $X_2$ ,  $X_3$ , and  $X_4$  are the three dummy variables,  $\alpha$  and  $\beta$  are population parameters; the  $\beta$ 's are the deviations from the omitted category  $X_1$ . When only the dummy variables (as in this case) are in the question, the coefficients are simply mean deviations. The last row in Table XII shows that the mean Grand Total change score for CONT was  $-.21$ ; for MCC  $.48$ ; and for MCC+FLIT it was  $.38$ . Table XV equation 1 shows that the regression coefficient for MCC was  $.69$ , which is actually the difference between the means for CONT and MCC from Table XII ( $-.21 - (+.48) = -.69$ ). This equation does not add any new information but is presented to indicate the point of departure.

When other interval variables, in addition to the categorical variables, are introduced in the equation, the regression coefficients for the three dummy variables are adjusted mean deviations – adjusted for the effect of interval variable. For example, equation number 6 has total number of members in the family (an interval variable) in



addition to the three dummy variables. The regression coefficients for the three dummy variables are mean deviations adjusted for the effect of total number of members in the family. The coefficients for the interval variable is the effect of that variable when all other variables are held constant.

The standardised regression coefficients also can be interpreted as above. In addition, as the coefficients are in standardised form, the coefficients in any one equation can be compared with each other directly. This facilitates determining the most important (or the most effective) variable for predicting that dependent variable.

The interpretation of regression coefficients are similar to that of partial correlation coefficients. This analysis makes use of the former for two reasons. First, since the regression coefficients are in the matrix of the dependent variable, the interpretation of them can be the units of change in the dependent variable for one unit of change in the independent variable. Such an interpretation may be more meaningful than presenting the coefficients in standardised units as partial correlation coefficients do. Second, the standardised coefficients (like partial correlation coefficients) are standardised for the standard deviations of that sample. So, the coefficients cannot be compared with such coefficients computed for other samples with different standard deviations, whereas the regression coefficients can be compared across samples. Because of these two reasons, this analysis prefers to present regression coefficients.

It was stated earlier that the Grand Total Standardised Scores will be used as the dependent variable for this analysis. It may be recalled that almost all items of the scales were scored as '0' for wrong response and '1' for correct response. When a variable is scored as 0 and 1, the mean of that variable, by definition, is the proportion who scored '1'. The mean Total Standardised Score can be thought of as the proportion who gave correct answers. For this analysis the regression coefficients for the three dummy variables can be interpreted as the proportion of women in an experimental treatment who gave correct answers when compared with CONT.

Perhaps a note of caution should be introduced. Since the FLIT treatment had too few cases ( $N = 12$ ) the coefficients may not be stable. So, although for the sake of completeness the coefficients for FLIT are presented in the table, no attempt will be made to interpret them.

*Interpretation of Data:* Table XV presents the data. Panel A dis-



TABLE XV: Several regression equations, predicting the dependent variable Grand Total Standardised Scores of measured change (Phase II)

Equation number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>A. Regression Coefficients:</b>																
1. FLIT	-.49	-.53	-.50	-.49	-.52	-.47	-.48	-.43	-.38	-.48	-.43	-.46	-.45	-.42	-.36	
2. MCC	.69*	.66*	.66*	.67*	.63*	.70*	.69*	.68*	.70*	.69*	.71*	.70*	.71*	.70*	.64*	
3. MCC+FLIT	.59*	.52*	.58*	.58*	.52*	.61*	.59*	.59*	.61*	.59*	.59*	.59*	.60*	.59*	.56*	
4. Caste group	-.25*				-.21*											-.19
5. Type of house		-.10*			-.07											-.08
6. Husband's education				.52	.54											.42
7. Total family members						.03				.04						-.04
8. Type of family							.06			.14						.04
9. Second wife								-.33	-.32							-.35
10. Age of respondent											.00					-.02
11. Total number of pregnancies												.05*			.28*	.26*
12. Total pregnancy wastage													.05		-.33*	-.26*
13. Total children alive														.05*	-.07	-.07
Constant	-.21	.33	.12	-.21	.46	-.40	-.24	-.19	-.53	-.33	-.33	-.41	-.31	-.40	-.50	.26
<b>B. Standardised Regression Coefficients:</b>																
1. FLIT	-.09	-.10	-.10	-.09	-.10	-.09	-.09	-.08	-.07	-.09	-.08	-.09	-.09	-.08	-.08	-.07
2. MCC	.32*	.30*	.30*	.31*	.29*	.32*	.32*	.31*	.32*	.32*	.33*	.32*	.33*	.32*	.32*	.30*
3. MCC+FLIT	.28*	.25*	.27*	.27*	.24*	.29*	.28*	.28*	.29*	.28*	.28*	.28	.28	.28*	.28*	.26*
4. Caste group		-.14*			-.12*											-.11
5. Type of house			-.12*		-.09											-.10

(Contd.)





plays regression coefficients and Panel B the standardised regression coefficients or betas. The regression coefficients for both MCC and MCC+FLIT are statistically significantly different from zero. This shows that the effect of being in those two experimental treatments were significantly different from that of being in the CONT treatment. Panel B shows that the coefficient for MCC was larger than that of MCC+FLIT. This shows that the change in knowledge, attitude and practice in the areas of health care, nutrition, family planning and global measures as measured in this study was greater for the women in the MCC treatment as compared to the women in the MCC+FLIT treatment. The last row shows the coefficient of determination ( $R^2$ ) which indicates that 12 per cent of the variance in the dependent variable was explained by the experimental treatments.

*Change not due to Socio-economic Status:* Equation 2 has caste group as an additional independent variable. Contrary to the hypothesis, caste was negatively related to measured change. This additional variable explains 2 per cent more of the variance in the dependent variable. Similarly when type of house is introduced (in equation 3) the coefficient is also negative. The coefficient for husband's education is positive but not statistically significant. Equation 5 has all the three indicators of socio-economic status selected for this analysis in addition to the three dummy variables for experimental treatment. The corrected  $R^2$ , i.e., corrected for the degree of freedom lost due to addition of new variables, was .12 which is same as that of equation 1. The coefficient for MCC is marginally reduced from .69 to .63 (compare equations 1 and 5) and for MCC+FLIT from .59 to .52 or 9 and 12 per cent respectively. In addition to the fact that the reduction is only marginal, the coefficients in equation 5 for the two treatments are statistically significant. This shows that the effects of experimental manipulation were *not* due to socio-economic status.

*Change not due to Family Characteristics:* Equations 6-8 introduce three family characteristics one at a time and equation 9 has all three variables. In this case also none of the coefficients for the family characteristics were statistically significant. The coefficients for the experimental variables hardly changed and they were still statistically significant. Panel B shows that the relative magnitude of the coefficients for MCC and MCC + FLIT did not change. The  $R^2$  changes very minimally, i.e., by .02 and  $R^2$  did not change at all. All these show that the changes that were perceived in the earlier sections



and attributed to the experimental manipulation could not be explained by the family characteristics included in this analysis.

*More Change with Greater Number of Pregnancies:* Each of the equations 10-13 contain one additional demographic characteristic in addition to the experimental variables. Among the four variables, the coefficients for total number of pregnancies and total number of children were statistically significant at .05 level. But the coefficients for the experimental treatment variables were not reduced at all. This shows that the variances explained by these demographic variables were independent of the experimental treatment variables. Equation 14 contains these demographic variables in addition to the experimental treatment variables. Here again the coefficients for the experimental treatment variables are hardly reduced (compare equations 1 and 14). The coefficients for total number of pregnancies and total pregnancy wastage were statistically significant. The former is positive and substantial in magnitude (panel B). This shows that in any one experimental treatment, the women who experienced a greater number of pregnancies registered more change than women who experienced a smaller number of pregnancies. Contrary to expectation, the coefficient for total pregnancy wastage was negative. This may be due to multicollinearity.

*Change due to Experimental Manipulation:* Equation 15 includes all the variables selected for analysis. It can be seen that the coefficients for MCC and MCC+FLIT were not changed at all. The additional variance explained by all other variables (10 in number) was only 8 per cent. From this analysis, one can firmly conclude that the *change in knowledge, attitude and practices that was observed in these women between Bench Mark and Resurveys can be attributed to the experimental manipulation* or at least not due to the variables included in the analysis. These changes were stable when examined singly or jointly with other variables that could be presumed to be related to change.

## Summary and Conclusions

As the title of the project shows, the entire project was concerned with the development of young children in rural areas. In order to develop young children (both mentally and physically) proper knowledge about health and nutrition was to be imparted to mothers. In addition their attitude and practice (wherever found necessary) was to be



changed in the desired direction. All this was sought to be achieved through informal discussion and demonstration in the non-formal education classes. So it was hypothesised that participation in the non-formal education classes will result in positive changes in knowledge, attitude and practice in the areas of health, nutrition, family planning and other areas.

It has been suggested that in addition to informal discussions and demonstrations if the illiterate women were provided with an opportunity to acquire literacy skills, then the increase in knowledge and change in attitude and practice may be larger. So, it was hypothesised that the change will be highest for the women who had both non-formal education and functional literacy. The hypothesised form of change for all the four experimental treatments may be presented as

$$\bar{G}_{\text{CONT}} < \bar{G}_{\text{FLIT}} < \bar{G}_{\text{MCC}} < \bar{G}_{\text{MCC+FLIT}}$$

where  $\bar{G}$  represents the mean change between Bench Mark Survey and Resurvey and the letters stand for the four experimental treatments. The change in knowledge, attitude and practice in the areas of health, nutrition and family planning was measured with the aid of individual items pertaining to one piece of information or attitude or practice. These individual items formed sub-scales, and sub-scales were summed into scales. Seven such scales were utilised in the study. This section compares these seven scales and a few broad conclusions will be drawn.

(a) *Sample Attrition and its Implications:* Before examining the data, the extent and magnitude of sample attrition should be brought out. The strategy adopted to draw the sample specified random selection at three levels, namely at village selection, assignment of experimental treatment to the villages, and selection of women. At every stage these principles were violated. In addition, the sample attrition was moderately high in MCC and MCC+FLIT treatments. It was lowest in CONT and highest in FLIT. The magnitude of bias introduced by sample attrition is not known. Data on selected socio-economic and demographic characteristics were presented for those who took part in the Bench Mark Survey and Resurvey. It was pointed out that the univariate distribution of those who participated in both the surveys did not differ very much except for FLIT. It is possible that the extent of bias introduced in the findings based on

those who participated in the Resurvey may be minimal.

(b) *Knowledge, Attitude, and Practice in the Areas of Health, Nutrition, and Family Planning*: As stated earlier, seven scales were utilised in the study. As the scales had a varying number of individual items, to facilitate comparison, the total mean change scores were divided by the number of items in the scale. Figure 1 graphically displays these results.<sup>2</sup>

The following observations are in order:

(1) The figure shows that all scales showed a positive change, and the changes were more pronounced in the three experimental treatments, namely FLIT, MCC and MCC+FLIT when compared with CONT. This shows that participation in non-formal education classes produced the expected results.

(2) When compared with CONT, the FLIT and MCC+FLIT treatments showed more change in all scales except for taboos (lactation) and MCC showed more change for all scales.

(3) When all the six scales are compared, it will be seen that the greatest change was registered for nutrition (general). This shows that the general nutrition lessons were more effective in producing positive changes. If the women put into practice the knowledge they have gained in the classes, their general nutritional level should greatly improve.

(4) The changes in the areas of health care and family planning (as indexed by absolute magnitude) were more or less similar. But regarding the relative magnitude of change, i.e., relative to CONT, it can be seen that more positive changes have occurred in the area of family planning. This shows that if it is desirable to improve the health of rural women and children, more concentrated educational effort is required.

(5) The hypothesised relationship between MCC and MCC+FLIT did not hold. That is, the women in the MCC treatment registered more change in nearly all scales than those in the MCC+FLIT treatment. It seems that rural women are able to absorb more information if it is provided through informal discussion and demonstration.

(c) *Child Mortality*: The study also showed that the women in control villages reported twice the child mortality than the women in MCC and MCC+FLIT villages.



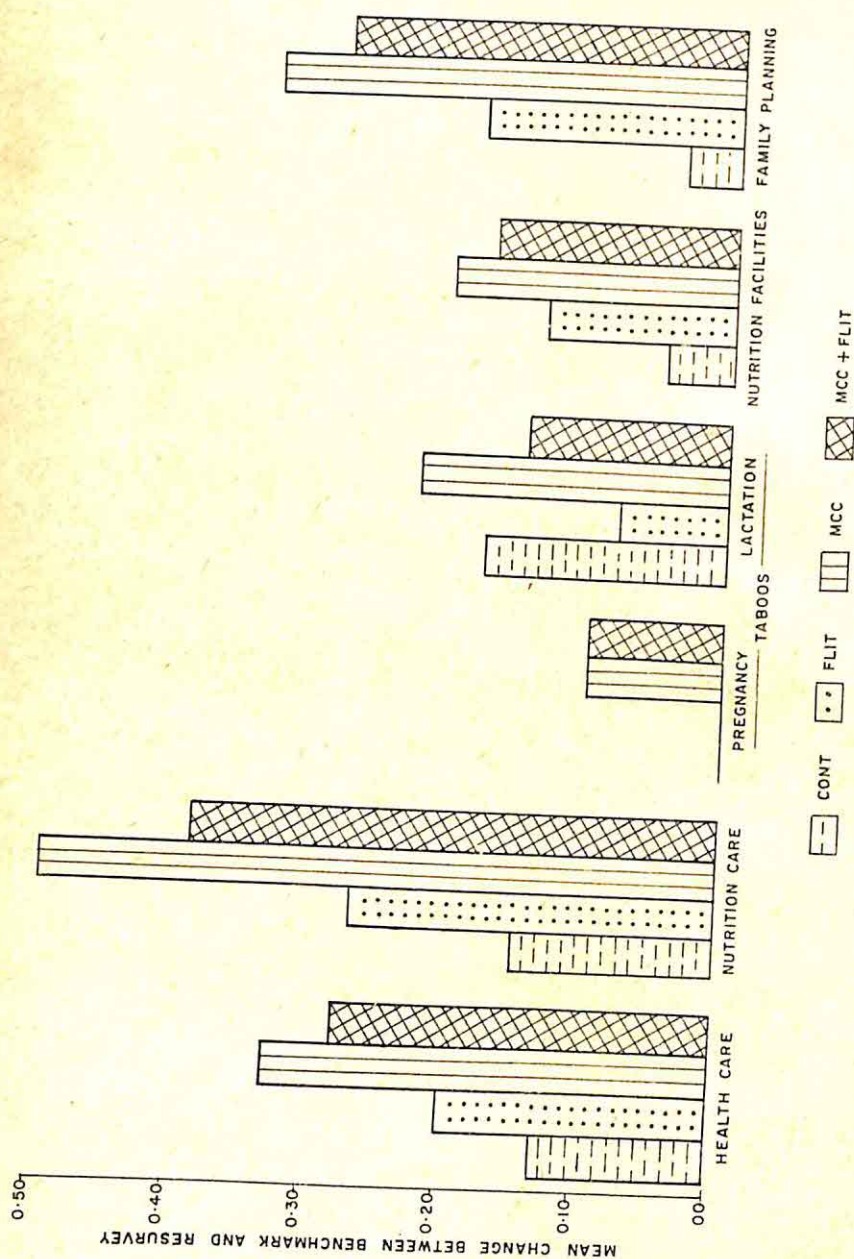


Fig. I CHANGE SCORES BY EXPERIMENTAL TREATMENTS ( PHASE II )

### How Lasting Were the Gains?

The earlier sections demonstrated that participation in the experimental manipulation (particularly in the non-formal education classes) resulted in gain in knowledge and change of attitude and practice. It may be recalled that the level of knowledge, attitude and practice was measured just after the conclusion of the classes. So, the question that needed to be answered was: 'How lasting are the gains?' This section proposes to provide some answers to the question from the results of a post-post-survey conducted one year after the end of the experimental treatments in Phase I villages.

Chapter II stated that the experiment was conducted in two phases, namely Phase I and Phase II; and that the women who participated in Phase I were interviewed at three points in time, namely Bench Mark (BM) before the start of the experimental programme ( $t_0$ ); at the end of the programme ( $t_1$ ) in a Resurvey (RS); and again about one year later ( $t_2$ ). Table XVI gives the number of respondents who were surveyed at these three points in time.

The table shows that although the planned sample size was 240, only 185 women were interviewed for the Bench Mark Survey. Among them only 140 (75.7 per cent) were surveyed for Resurvey and 116 (62.7 per cent) for the post-post-survey. Most of this sample attrition was due to the very high sample attrition in the FLIT treatment where only about one-fifth of the original sample was surveyed for the post-post-survey. This section presents data for these 116 women who were interviewed in all the three surveys.

*Scales:* To measure the level of knowledge, attitude and practice in the areas of health, nutrition and family planning for the three surveys, the same scale items were made use of in the three surveys (in fact the same items were also used for Phase II). The scale items were grouped under seven scales, namely: (1) health care; (2) nutrition care; (3) taboos during pregnancy; (4) taboos during lactation; (5) attitude and knowledge towards family planning; (6) facilities for supplementing diet; and (7) global measures of change. (For the individual scale items, the reader should refer to Tables I, III and VII.) For the purposes of this section, the last scale (global measures of change) is omitted and the two scales on taboos are combined to form one scale. So only five scales are presented in this section. In order to facilitate comparison across the scales, the scores were divided by the number of items in the scale and presented as standardised scores.





*Mode of Presentation:* As pointed out in the beginning of this section, the correct answers for each individual scale items were scored as '1' and wrong as '0'. The score obtained by an individual at the time of the Bench Mark Survey was subtracted from the score obtained at the Resurvey and termed as  $\bar{G}_1$  and the means are presented. This is a measure of change due to experimental manipulation. The scores obtained at the Bench Mark Survey were subtracted from the scores obtained at the post-survey and presented as  $\bar{G}_2$ . The score obtained at Resurvey were subtracted from the scores at the post-post-survey and presented as  $\bar{G}_3$ . If the level of knowledge, attitude, and practice was higher at the post-post-survey than at Resurvey,  $\bar{G}_3$  will be positive. This can be interpreted as gain in knowledge since the conclusion of the experimental manipulation. This gain could be due to 'sleeping effect' or due to the durability of the education programme inculcating a continued learning capacity.  $\bar{G}_3$  will be negative if level of knowledge of post-post-survey was lower than that of knowledge at Resurvey. This can be interpreted as loss in knowledge that has occurred since the conclusion of the experimental programme and therefore the programme effects were very temporary and not durable. If the  $\bar{G}_2$  scores were similar to the  $\bar{G}_1$  scores, i.e.,  $\bar{G}_3$  was 0, then the effects were durable but no continued learning capacities were inculcated.

*Findings:* Table XVII presents data when the means at the Bench Mark Survey are compared. It will be seen that all the four groups were similar for all the scales and this validates the homogeneity of the sample. The  $F$  values for  $\bar{G}_1$  of all the scales except facilities for supplementing diet were statistically significant. This shows that the experimental manipulation had differential impact on the women. The gains registered by all three action groups, namely FLIT, MCC, and MCC+FLIT, for health care and family planning were significantly different from that of CONT. In addition, for the scales nutrition care and taboos, the MCC and the MCC+FLIT treatments registered a more significant change than the CONT. The gain registered by MCC was larger than that registered for the MCC+FLIT treatment for the scales health care and facilities for supplementary diet. These observations are similar to those of Phase II data presented earlier except that the differences between MCC and MCC+FLIT were greater in Phase II.

The mean  $\bar{G}_3$  scores were positive for the scale health care for all the four groups. This indicates that the level of knowledge, attitude



TABLE XVII: Total standardised scores for all the scales used in the study during Bench Mark Survey (BM), Resurvey (RS) and Post post-survey (PPS), mean change between BM and RS ( $\bar{G}_1$ ), BM and PPS ( $\bar{G}_2$ ) and RS and PPS ( $\bar{G}_3$ ) by experimental treatments (Phase I)

		Experimental treatments			
		CONT (N=40)	FLIT (N=10)†	MCC (N=40)	MCC+FLIT (N=26)
1		2	3	4	5
1. Health care	BM	.38	0.36	0.39	0.38
	RS	0.28	0.38	0.47	0.45
	PPS	0.36	0.44	0.53	0.52
	$\bar{G}_1^*$	-0.10	0.02**	0.08**	0.07**
	$\bar{G}_2^*$	-0.01	0.08**	0.14**	0.14**
	$\bar{G}_3^*$	0.08	0.06	0.06	0.07
2. Nutrition care	BM	0.77	0.81	0.86	0.82
	RS	0.80	0.93	1.06	1.01
	PPS	0.72	0.86	0.99	0.93
	$\bar{G}_1^*$	0.03	0.12	0.20**	0.19**
	$\bar{G}_2^*$	-0.05	0.05	0.12**	0.11**
	$\bar{G}_3^*$	-0.10	-0.08	-0.09	-0.09
3. Taboos during pregnancy and lactation	BM	0.68	0.71	0.68	0.64
	RS	0.64	0.70	0.73	0.73
	PPS	0.70	0.73	0.71	0.73
	$\bar{G}_1^*$	-0.05	-0.01	0.06**	0.09**
	$\bar{G}_2^*$	0.02	0.02	0.03	0.09
	$\bar{G}_3^*$	0.06	0.03	-0.03	-0.01
4. Family planning	BM	0.05	0.09	0.09	0.05
	RS	0.08	0.23	0.30	0.28
	PPS	0.05	0.25	0.19	0.26
	$\bar{G}_1^*$	0.03	0.14**	0.22**	0.23**
	$\bar{G}_2^*$	0.00	0.16**	0.10**	0.21**
	$\bar{G}_3^*$	0.01	0.08	-0.03	0.06
5. Facilities for supplementing diets	BM	0.30	0.37	0.43	0.36
	RS	0.45	0.40	0.53	0.42
	PPS	0.33	0.50	0.52	0.50
	$\bar{G}_1$	0.15	0.03	0.10	0.06
	$\bar{G}_2$	0.03	0.13	0.09	0.14
	$\bar{G}_3$	-0.12	0.10**	-0.01	0.08**

\* F value significant at .05 level.

\*\* 't' value of the difference between that score and that of control is significant at .05 level.

† As the N is small, data should be interpreted with caution.

and practice in the area of health care as measured and reported were higher at the post-post-survey than at Resurvey. Further, the scores were more or less similar and not statistically different for all the four groups. This perhaps should be interpreted as due to sleeper effect. The fact of being questioned on these items perhaps stimulated thinking of the women, even the ones in CONT treatment where no classes were conducted.

With regard to the scale nutrition (general), the mean  $\bar{G}_3$  scores were negative. To some extent, apparently the women have forgotten whatever they have learnt in the classes and perhaps they have lapsed back in the practice also.

The magnitude of all the three mean  $\bar{G}_3$  scores for the scale taboos during pregnancy and lactation were small. This shows that the effect of participating in the non-formal education classes did not initially produce much change and did not last for a longer period.

With regard to family planning techniques, the level of knowledge and attitude were higher at post-post-survey than at Resurvey. As pointed out earlier, the people of this area had a negative attitude towards family planning, for it was perceived as sterilisations only. The data show that there was positive gain in knowledge and attitude due to participation in the education classes and such positive effects were not lost even after the classes were withdrawn.

For the scale on facilities for supplementing diet, the data reported in the table show that positive gains were reported for FLIT and MCC+FLIT treatments and more or less the same levels for MCC treatment.

*To Sum up:* In the areas of health care and family planning the level of knowledge, attitude and practice showed a gain even one year after the experimental treatment was concluded. With regard to nutrition, it was seen that there was a lapse back into 'old ways' between Resurvey and post-post-survey. If it could be assumed that the measures employed were sensitive enough to measure even minor changes it can be stated that more concerted efforts in the area of nutrition are needed if the effects of the non-formal education classes are to last for a longer period of time.

Perhaps it should be pointed out that (as stated in Chapter II), Phase I was conceived as a pre-test so that Phase II may be carried out appropriately. As revealed by  $\bar{G}_1$  scores, even the experimental manipulation had a modest effect only. Given this, it is a bit premature to raise the question: How lasting were the effects? We demonstrated



a methodology to examine this question. It is strongly urged that the respondents of Phase II may be surveyed again so that a few definitive answers to the question may be provided.

### **Notes and References**

1. N.D. Draper and H. Smith, *Applied Regression Analysis*, New York: John Wiley & Sons, 1966, pp. 134-141.
2. The scale for Global Measures of change is omitted because of negative values which were contributed by two sub scales.

## CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

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### *Abstract*

This chapter has four sections: *Section A* summarises: (i) the objectives and expected results of the project, (ii) the action programme, and (iii) the research. *Section B* draws conclusions from the findings to present the relative effectiveness of the three experimental treatments on various variables and the three basic aspects of the programme – education, medical services and supplementary feeding; examines the durability of the programme; from the sample attrition and the special in-depth study of the non-participants and drop-outs it infers the characteristics of the women who are likely to be the most successful recipients of the programme; and reviews the findings of the three subsidiary studies on psychomotor development, cognitive structure and cost-effectiveness. *Section C* presents the more specific programme recommendations: reviews our experience with the three treatments and based on the effectiveness (presented in the findings above), makes recommendations for the wider extension of the MCC treatment; discusses the staffing of the programme, duties and devolution of responsibilities; makes recommendations for the selection of the basic package of services for health and nutrition which should be used for the wider extension of the programme; recommends a more selective approach in extending FLIT; reviews the experience gained on materials preparation and testing; recommends what further testing is needed before their wider application and points out the limitations of these materials for functional literacy and non-formal education; and suggests measures to control the attrition. *Section D* deals with the *implications* of the results of this project for the immediate future: makes a brief comparison of the ICDS programme and the MCC model recommended for wider dissemination; explains why the third phase of this project should be executed in at least one block on a pilot basis for at least three to five years; explains the need for further testing of materials, monitoring and a strategy for research; and finally, recommends the linking of community and individual economic programmes to increase participation and to generate self-reliance and a gradual reduction of the supplementary feeding programme costs.



BEFORE THIS PROJECT was launched in August 1972, the UNICEF and the Council for Social Development, the sponsors and the executors of the project respectively, took considerable pains to bring together the best advice from a number of different Government and research bodies. A number of Task Forces of the Government of India were working on the concept of an integrated package of child care services; but these were largely exploratory. The Committee which met informally to help with the design of this project, consisted of members from WHO, UNICEF and the Ministries of Education and Social Welfare, Health and Family Planning, and Agriculture and Community Development (now Rural Development), some of whom were on Task Forces or had other varied experience. The blue-print went through several revisions before it reached its final shape under the longish title: 'An Experimental Non-formal Education Project for Rural Women to Promote the Development of the Young Child'.

#### A. OBJECTIVES AND EXPECTED RESULTS

The project had seven objectives: one dealing with the preparation and testing of materials, three with the testing of immediate and long-term effects, two with attrition and the characteristics of the target group most likely to succeed, and one with the most economic organisational structure which could be used for extending the programme.

There were also seven expected results following from the project: two dealing with the production of tested materials, two with research evaluation and monitoring, two with outlining the most economic system for wider extension, the last justifying the hope that the three models would have been tested.

At the end of the first year of operation, a small folder projecting the purpose and the expected benefits of the project under the title 'Non-formal Education for Rural Women' was produced. The primary objective, not overtly stated, became the production of a working model for the delivery of a 'basic package of integrated services [which] has three components: education, medical services and nutritional supplements'. The folder described six expected results: two dealt with tested materials for functional literacy and non-formal education; two dealt with selecting the basic package and the most economic organisational structure for the wider extension of the programme; one dealt with identifying the target group and one with the research methodology for evaluation.



At the end of the first phase of the project the Council presented the highlights of the first phase of the study to the annual UNICEF meeting in October 1974. In this brief report was mentioned only one objective: 'to evolve through experimentation a delivery method for an integrated package of services of education, health and nutrition'. The report had five expected results: two dealing with tested materials, two with the basic package and the most economical delivery system and the last with a research and monitoring system.

At this stage, it was felt necessary to review the objectives and expected results of this long and complex research-cum-action experimental project. Unlike pure research, applied research has practical relevance to the sponsor. Our direct sponsor was UNICEF but indirectly it was the Government of India in the Department of Social Welfare. The Council has kept an 'open house' into which UNICEF consultants could have and have had complete access and have more often acted as colleagues and co-workers rather than 'policemen': the entire testing and feedback system for the teaching materials was partly designed by a UNICEF Consultant during a field visit; another Consultant had recommended a revision of the draft project design. The Council has responded to these 'suggestions' and incorporated them into the project as it went along. Similarly, the Advisory Committees at the national or State level have made important suggestions which needed to be incorporated into the project. All this helped to clarify and specify objectives and expected results rather than abandoning them. This unique dynamic relationship between sponsor, approver and the research body has been documented because the objectives, emphasis and expected results have changed over the life of the project.

In presenting the conclusions and results of this experimental applied research project, not only have the original objectives and expected results been kept in mind but also the changes which were incorporated in objectives, emphasis and expected results. It was therefore necessary to review and to summarise the objectives and the expected results of this experimental project at different stages.

### **1. Action Programmes**

We were able to undertake with greater confidence the operations of the action components of this experimental project, thanks to the common heritage that the Council shares with the Andhra Mahila



Sabha's institutions, the ANM Training Centre at Mahbubnagar and the Hyderabad Literacy House. These institutions have also a common founder in the person of Dr. (Mrs) Durgabai Deshmukh. It was quite appropriate that in an integrated programme of non-formal education for Andhra women, the very wide spectrum of institutions and practical experience engendered by the Andhra Mahila Sabha should have been utilised.

Right from the production of teaching materials, through the recruitment, in-service training, initiation and operation of the two phases of the programme, vast uncharted territories have been 'discovered' in both the qualitative and quantitative aspects of the programme which have never been fully explored. Many of these *failures* have been documented as accurately as possible. In fact, the project has revealed far more of what is *not known* about the operation of such a scheme than what is known.

For too long since independence have welfare or community development programmes put various problem 'failures' under various rugs. The research costs of constructively digging out these skeletons from our closets was one of the necessary, but not sufficient, conditions for putting the Integrated Child Development Services (ICDS) scheme on a qualitatively pragmatic threshold.

All 'experimental treatments' which we tried to operationally put on the ground, in two phases, are still fraught with many lacunae as we will elaborate below. The production and testing of non-formal education materials need several cycles of trial and error before one can honestly consider them qualitatively adequate. The selection, training and in-service supervisory linkages of various levels of staff for such a programme still need a great deal of streamlining. Finally, the selective deletion to a minimal but adequate record-keeping system to monitor and keep accurate administrative intelligence still needs further study.

## 2. Research

The feed-forward research to help design materials, we felt, was utilised a great deal but could be done more effectively. The feedback research system to evaluate and revise teaching materials has not been operationalised sufficiently and needs at least one more round of trial and error before it can be effective. This is one of those action-research sequential paradoxes where until the materials are sufficiently

utilised and all visuals selected, the feedback system cannot be adequately tested or utilised.

The Bench Mark and Resurvey evaluation was perhaps the most satisfactorily operationalised and has yielded some useful findings. The problem of adequate randomness resulting from various stages of attrition raises some theoretical questions about the appropriateness of using parametric tests and the representativeness of the final samples.

The sub-studies on fundamental areas, such as psychomotor growth or cognitive structure using Indian adaptations of Western tests, were adequately performed. The former was found quite useful for measuring one aspect of this project. But the methods we applied and the utility of cost-effectiveness during the experimental phases of a project were provisional and could not yield useful cost data for a more widely extended project.

## B. CONCLUSIONS

There are essentially three components of the 'Basic Package' of integrated services:

- (a) an educational *component to arouse interest* and to find practical solutions to identified 'felt' problems of the area related to pregnancy, child-birth, lactation and child health;
- (b) a 'basic' *medical* delivery service for women and children; and
- (c) a supplementary *feeding* programme to bridge the most critical nutritional gaps in the 'vulnerable' target groups selected.

### 1. Effectiveness of Treatments

We had hypothesised that the combined treatment MCC+FLIT would have the greatest impact, followed by MCC and then FLIT. In Table I (see Appendix 18) we have summarised the findings on the major variables which were measured. These are:

- (1) On every measure of health, nutrition and family planning, the MCC treatment showed the largest gains which were significantly greater than the CONT villages.
- (2) The combined treatment MCC+FLIT showed the next highest level of change, but was consistently lower than the MCC treatment. The differences in this case also were significantly



greater than the differences in the CONT villages.

- (3) The changes in the FLIT villages were more modest in the area of health and nutrition and not significantly different from CONT villages. Only in the area of family planning were the differences significantly greater than in CONT villages.
- (4) In the literacy measures only the FLIT treatment *per se* seemed to make significant changes in the three R's. The combined treatment of MCC + FLIT made only modest changes in three-R competence which we would not consider a functional level and therefore more liable to lapse into illiteracy.
- (5) With regard to child mortality during the period of the project, the women in CONT villages reported twice the magnitude when compared to women in MCC and MCC+FLIT villages.

With regard to the *educational* component of the basic package, our hypothesis that the combined MCC+FLIT treatment would be most effective, has *not* been borne out by the findings. The evidence indicates that the combining of the literacy component does not achieve the desired level of literacy competence. On account of the time taken for literacy, the gains in nearly all other measures of health, nutrition and family planning are less than the MCC treatment alone. The FLIT treatment did turn out to be a good educational vehicle for health and nutrition and not as good a vehicle for changing knowledge or attitude about family planning. In short, based on this project the conclusion we draw is that the *MCC treatment was clearly the best educational method* for teaching rural women how to solve their most pressing health, nutritional and family planning problems.

As for the second and third components of the package, since the delivery of health services and the supplementary feeding were only given in the MCC and MCC+FLIT, these two treatments were combined and compared with the two non-service treatments. When comparing the service with the non-service treatments, the evidence from the relative decrease of nutritional symptoms in both children and their mothers was unambiguous and consistent (see Table II Appendix 18). On every one of the measures for both children and mothers, the service treatments showed a greater decrease in morbidity than the non-service treatments. Women seemed to have more nutritional deficiency signs than children, particularly with respect to iron, vitamin A and vitamin B. Although the reductions were greatest in iron and vitamin A deficiency signs in women, the



reduction in nutritional deficiency symptoms was modest.

Using either the growth charts for children, or the weight for age percentage computations, we found that there were statistically significant differences in the changes between service children and non-service children. Again we found, that when compared with an international standard like the Harvard weight for age growth-curve, the gains of service children were only modestly better in real terms; probably 10 months is too short a period of time for a supplementary feeding programme to show any greater change. In effect, we may draw the conclusion that the *MCC service package made modest but significant reductions in nutritional deficiencies in both women and children.*

(The inferences that we derive with respect to the delivery of the medical package and the supplementary feeding programme are not from these findings alone. The descriptions of the quantum of medical services delivered in terms of either man-days or clinical service calls will also be used to arrive at inferences for an adequate delivery system.)

*Basic Medical Services:* The medical delivery system which we attempted to install was a basic package of ante-natal, natal and post-natal preventive and curative services for women and children. For purposes of this experiment, the doctors', nurses' and ANMs' medical services were in general limited to only the sample women and their children. The ANM did not undertake the delivery of babies but helped train and assist the local *Dai*. A trained nurse in our programme typically held the responsibility for curative services for two villages aided by the ANM, except when four (out of six) of the nurses resigned for better jobs during Phase II and the ANMs carried on the curative services on their own. If ANMs are backed up, trained and permitted to deliver a minimum package of curative services, we feel, they will be able to take care of over 95 per cent of common maternal and child health problems in villages.

For the slightly more difficult, about 8 per cent, of curative needs, a bi-weekly visit to the MCC by a doctor and nurse combined, with referrals to the PHC would seem to be the best strategy. If the major responsibility for non-formal education and the feeding programme are taken away from the ANM, then her span of coverage for the basic medical services can be increased from about 2,000, to as many as 5,000 total population, if carefully planned and spatially managed.

*Supplementary Feeding:* The supplementary feeding programme



was conducted on all target sample women and their children, using a take-home standard quantity supplied by CARE for the pre-school feeding programme. Because of the fact that the ANM who was also the Health Educator, visited houses regularly and made special enquiries about the food being eaten by the target beneficiaries, probably a larger proportion reached the desired target. No accurate estimate could be made of the quantum that did not reach. We felt that the sharing of this supplementary food was due to the relative poverty of the family. Since this was a fairly carefully supervised experiment, the losses due to spoilage and pilferage of food were practically negligible.

While this 'take-home' system is probably the most inexpensive way to deliver food to a theoretical target population, it has certain built-in inadequacies:

- (a) Some unknown quantum of the food will be distributed to the non-target population of family members. In a drought-prone area, which is nutritionally chronically deficient, this would be impractical to police. Hence, we may assume that the take-home package feeds the *family* of all target women. One may use the demographic difference between the target women and children alone and their entire families as the maximum loss factor, particularly under drought conditions. This loss may be credited to a poverty feeding programme for the most needy families.
- (b) Not all pregnant, lactating and weaning women and not all their children show signs of malnutrition. If the iron and vitamin A deficiencies can be treated by the massive dosages administered as part of the medical programme and if the supplementary feeding 'target' is reduced to only those among the target population who show PCM and vitamin B deficiencies, then we could substantially reduce the size of the feeding programme by about 50 per cent. As these symptoms disappear, the supplementary feeding target would get even smaller. In short, the investment in a regular medical testing system could rationalise the selection of and radically reduce the size of the target group which needs supplementary feeding. Second, as the educational, medical and feeding treatment package becomes effective, the size of this target group will decline further and eventually disappear.

## **2. Durability**

The two strategies of education used in this project were functional

literacy and non-formal education. Both strategies utilised the felt problems of women in the area to motivate them. They would not only learn about solving their *present* problems but would also acquire the ability to learn the technique of solving their problems. The rationale of using functional literacy was that this essential skill would facilitate further learning. Hence, we expected that the women who had become literate would, even after one year of the termination of the project, continue to learn more than the other women in the non-formal education (MCC) treatment or the women in the control treatment.

For testing this, a third post-post-survey was conducted a year after the Phase I action programme had stopped. Then the results of the three surveys were juxtaposed – the Bench Mark Survey (BM), the Resurvey (RS), and the Post-post-survey (PPS) – and gain scores computed between each of the surveys. From the data presented in the findings we cannot draw any clear conclusions. As indicated in the earlier chapters, the Phase I villages did not have a large enough sample nor were the experiments effectively conducted in those villages. This is, however, an important aspect of the experiment and it will be essential to test the women in the Phase II villages a year later to prove the relative durability of the treatment.

### 3. Successful Recipients

An important problem which has plagued educationists, particularly those concerned with formal primary education, has been drop-outs, wastage and stagnation. As India and other parts of the Third World plunge into varieties of non-formal education, the problems of attrition should be carefully examined and early steps taken to cut these losses; otherwise the cost-effectiveness of those programmes may become prohibitive.

Various strategies may be adopted to obtain 'successful' results. One is to select recipients on characteristics known to be related to high attendance. This may defeat the very purpose of the programme, which is to serve the nutritional and medical needs of the poorest sectors who do not have high attendance. A second strategy would be to design programmes for the poorest sectors and devise ways for increasing their attendance by adjusting the programme closer to their needs.

*Reaching the Poorest Sectors:* In this experiment, some precautions were taken *not* to select the villages or the women who would be most



successful. First, a backward chronically drought-prone district was selected. Second, the project was designed only for illiterates and hence the lower educational stratum. Third, in order that the experiment could be extended into a replicable model, great care was taken to select villages from a randomly selected homogeneous group of villages and to select participants randomly from each village. Hence, the original sample was 'representative' for this kind of package of interventions geared to the needs of the lower half of the rural population.

*Three Frustrating Problems:* Three peculiar problems of the experimental study should be mentioned that are related to a package programme approach of interventions.

*First*, the 'target' group were pregnant, lactating or weaning women and their children. We discovered early this was a moving target and unless one worked fast, we may miss our target. For example, the typical lead time from selecting the pregnant sample women (who were in the second or third trimester of pregnancy), motivating them to participate, conducting the Bench Mark Survey, training our action workers and getting the programme started, was two to three months. Nearly half our pregnant target could not hold their babies and had passed on to being lactating mothers. In fact, our three target groups nearly all passed to a different target status by the end of the programme.

*Second*, since two of the treatments were literacy, we had to select only illiterates for all the treatments of our project. The main language was Telengana Telugu and we therefore limited our respondents to Telugu-speaking illiterates and prepared our materials in this language. We had also to exclude those villages which were predominantly tribal (the lambadis) or Muslim. Since literacy classes need a sustained sequential learning of alphabets and numbers for a basic period of at least 2-3 months, the pregnant women had to face special problems regarding regular attendance.

*Third*, the beneficiaries of a medical and supplementary feeding programme must regularly participate in order that the effects of the programme can become manifest. It was very frustrating for a doctor to prescribe medicines for a woman one week and could not find out what effects it had on her the next week. In the supplementary feeding programme, if the take-home food was not taken by the *same* child for a sustained period of about a year, it was not likely to show much difference in growth.



An integrated package programme must ensure that all the basic components of the programme are reaching the target group. Our record-keeping did keep records on a number of qualitative aspects of the different programmes, though all of them are not presented here. Even the criterion of attending at least 25 per cent of the classes is a modest one. (In the psychomotor tests, the psychologist insisted on at least a 50 per cent participation.)

*Causes of Attrition:* In our total planned sample of 660 respondents for Phase II, we ultimately interviewed just under 50 per cent who had participated in the four treatments. We will first present the major causes for attrition and then the steps that could be taken to reduce attrition.

Table IX in Chapter XV presents the attrition in the four treatments at the three stages at which we felt attrition took place.

*First*, between the time the motivation team persuaded the participant to join the programme and the time the Bench Mark Survey was undertaken, about 20 per cent of the sample was lost. This attrition was most serious in the literacy programme (45 per cent) and can largely be attributed to what we call a deleterious 'spill-over' effect of participants coming to know that the literacy programme will not have the medical and supplementary feeding services of the other programmes.

*Second*, if the level of attendance was less than 25 per cent, we did not recognise a person as a participant. On this criterion we lost a little below 20 per cent. Again, the main losses were in the literacy programme where another 42 per cent were excluded (of these, about half attended less than 10 per cent of the classes). The MCC programme suffered less than a 20 per cent due to our criterion of low attendance.

The *third* cause of attrition was more of procedural character. At the time of Resurvey, which takes two or three days in any village, with a mop-up of one day, maybe 2 or 3 weeks later, we make three call-backs to ensure whether the respondent is available. In total we lost about 14 per cent of our respondents because of non-availability. It may be recalled that we changed our strategy of field work in the Resurvey (Phase II) because of the expected migration for work and the Ugadi (New Year Day) when a number of women would go to their mothers' village. The burden of losses fell on the CONT villages which were being interviewed at that time. The losses in the programme villages were only about 2 to 7 per cent.



In an attempt to explain the causes of attrition we used two methods: the first was an objective measurement of socio-economic characteristics of respondents at the Bench Mark and Resurvey. This misses the initial stages of attrition. No clear pattern of bias seemed to emerge. In the literacy treatment the proportion of labourers, and more specifically agricultural labourers, decreased. There was a modest increase in proportion of nuclear families in the MCC treatments. Hence, we did not feel that our analyses were affected a great deal by socio-economic bias in our drop-outs.

*An In-Depth Study:* In order to obtain some qualitative answers as to why people dropped out or did not participate, we did a modest in-depth study reported in Chapter XXII. Lack of time, family resistance and a low level of motivation for any kind of education and literacy, seemed to be the primary factors for low participation. The absence of material incentives was the main cause of the lower level of participation in the literacy treatment alone, i.e., the FLIT treatment. By providing the medical services and supplementary feeding, one may very greatly increase the participation as evidenced by the MCC+FLIT treatment; but they will miss a great deal in literacy. One may negatively infer from these data that in areas of 90-97 per cent levels of illiteracy, the perceived need for women's education or literacy is very low. Hence, a great deal more time and energy may need to be spent on motivating not only the women but also their families.

Other problems, like the one of credibility, on the assumption that the teachers were the agents of the sterilisation campaign, or adjusting the time classes are held, will need to be resolved and mutually agreeable solutions found. The problem of spatial planning to minimise travel for both the MCC and FLIT Centres can be worked out with good maps of the target area so that both the ANMs and women in the villages do not have to travel more than 3 to 5 km to their MCC Centre.

#### **4. Subsidiary Fundamental Studies**

(a) *Psychomotor Development:* The Indian adaptation of the Bayley Scale of Infant Development (BSID) was used to measure motor development and mental development comparing children who did not receive any medical and nutrition services in the FLIT and CONT villages with children in the two MCC service experimental

treatments. The results indicate that the treatments providing the basic package of medical services coupled with the supplementary feeding seemed to have had some impact.

The impact on motor development was more pronounced than mental development (see Table III, Appendix 18). Of the two service treatments, the MCC seemed to be a little less effective than the combined MCC+FLIT treatment, which was not consistent with the tests in the other variables of the findings. However, differences between the two service treatments were not large and probably not statistically significant. It was found that a number of social background and environmental factors affected motor and mental growth scores.

The project has demonstrated the utility of the BSID as a discriminating instrument when used in backward rural areas and in adverse village interviewing conditions. Hence, we can conclude that if the ICDS programme is extended, the Indian adaptation of the BSID can be used even in backward rural areas as a reasonably standardised test for motor and mental development of the young child.

(b) *Cognitive Development*: On the possibility that the novel and systematic stimulation received in the non-formal education and functional literacy classes could change the cognitive level of women, they were measured both at the Bench Mark Survey and at the Resurvey using the Indian adaptation of the Lowenfeld Mosaic Test. The test requires the subject to fabricate a design on a tray by arranging brightly coloured plastic pieces.

The results presented in Table IV (see Appendix 18) show that the women who attended the classes appeared to be taking more time, using more sub-designs and in the literacy treatment using more space available while fabricating the designs chosen by them. Apparently among the women in the experimental groups, this can be interpreted as a trend towards expression and extension in the psychomotor process. Since this test required a great deal of coding by several judges, it was used only in Phase I of the study and the findings can only be tentative.

(c) *Cost-effectiveness*: The problem of cost-effectiveness is of crucial importance in any experimental social model-building. In this project we encountered two problems: *first*, the proper budgeting and expenditure items which need to be accurately maintained, had to be specified from the beginning of an experiment. Appointing a



Consultant to dig out this information *ex post facto* from accounts and results, not specifically designed for this purpose, was a very frustrating venture. *Second*, the use of the experimental phases which are designed to be much more intensively staffed, supervised and researched, yields spuriously high unit costs per beneficiary from which it would be dangerous to extrapolate. One even hesitates to provide such figures because the unwitting critic may use them in an inappropriate manner.

An attempt has been made to apportion the major budget heads to the different components of the project. From these the operating costs per centre for the experimental programmes were computed. To obtain per capita costs, the total programme costs for Phase I and Phase II which lasted altogether for two years, first in 6 villages and then 16 villages, were divided by the number of participants who attended at least 25 per cent of the classes. While this method may appear to be fool-proof, the figures will be spuriously high. If, as budgeted, the total target samples had attended, then costs would have been more reasonable for an experimental project as shown in row A-3 of Table V (see Appendix 18).

These unit costs are then used along with the net gain scores (computed from Table I) to determine the relative effectiveness of the educational component of the integrated experimental treatments. The rupee figures again do not provide a correct picture. The total per capita cost should be allocated between each part of the educational effects and the medical and nutritional benefits by some method of *a priori* or *ex post facto* weightage. This second type of allocation has not been attempted.

As will be seen from Table I, the MCC treatment *per se* was relatively the least costly to bring about one unit of change as measured by gain scores in the entire health, nutrition or family planning components of the non-formal education programme. The FLIT treatment was the most costly, and this may be partly because the FLIT materials did not fully cover these topics or that the demonstration effects of the health and nutritional services proved to be better teachers than more literacy. (The Gandhian dictum of God coming to the poor in the form of bread still holds good.) However, with respect to teaching the three R's of reading, writing and arithmetic, the 30:103 ratio indicates that per unit of three R's learned in the FLIT treatment is more efficient than the combined MCC+FLIT treatment.



These cost-effectiveness computations generally support the previous findings that not only does the MCC treatment bring about the greatest number of changes but it is also the least costly way of bringing about the changes. However, if literacy is the goal, then the FLIT treatment *per se* would be by far the most economical vehicle.

## C. PROGRAMME RECOMMENDATIONS

### 1. Mother Child Centres

The results obtained from the two phases of the experimental treatments clearly indicate that the MCC treatment gave the most satisfactory results. That the relative success of the MCC treatment was due to the dedication and hard work of the doctor cannot be ruled out. A modicum of commitment, zeal and industry are necessary to make any new experimental programme work. Much of the burden of curative and preventive care was borne by the nurses and the ANMs posted in the peripheral MCC villages.

The experiment has demonstrated that with training, medical support and encouragement, the basic package of preventive and curative service burden can be transferred to ANMs at the peripheral Mother Child Centre. If these medical services are linked to a regular supplementary feeding and non-formal education programme, the total package can be carried to all pregnant, lactating and weaning mothers in a village. We would recommend that this basic package of services may not be limited to any experimental group but that it should be available to all. A certain proportion of perhaps 20 per cent may not participate initially and another 20 per cent may attend irregularly; but we believe a well-executed MCC programme can cut this non-participation or low-participation from 40 to, maybe, 20 per cent.

An integrated package delivered to about 80 per cent of all vulnerable groups of women and children below the age of six in rural areas will make significant reductions in morbidity and mortality.

*Coverage:* The experiment was carried out under intensive supervision to test the devolving of medical responsibilities to the nurse in two villages. As has been reported, it was also demonstrated that the ANM could undertake this responsibility even if the nurse should resign. The ANM's role here was that of the non-formal education teacher and the person in charge of the supplementary



feeding programme. If the major burden of the teaching and feeding function is passed on to a non-medical functionary such as the *Balsevika* or *Anganwadi-sevika*, then the ANM's coverage for the basic medical package can be greatly increased.

The coverage of both the ANM and the *Balsevika* should be about five villages or a population of about 5,000 within a spatial reach of 3-5 kilometres. As we have indicated in the experimental phase, the intranatal services should not be taken away from traditional *Dais* for the present. The medical package should emphasise the preventive package of pre-natal and post-natal checks, immunisation and screening of all pregnant and lactating mothers and young children below five for symptoms of malnutrition. The ANM should work as a team with the *Balsevika* who will be responsible for the supplementary feeding programme and for organising the non-formal education programme.

Spatially, the ANM and *Balsevika* should both be stationed in the same centrally located service village where an MCC will be established. In the four surrounding villages served by this MCC, the *Balsevika* may establish *balwadis* served by *Anganwadi-sevikas*. The ANM will establish contact with all traditional *Dais* in the five villages under her charge to conduct training for and supervision of all child deliveries. The ANM and *Balsevika* will jointly conduct the household census and the first routine medical check (RMC) and will thus have complete records of all pregnant and lactating mothers and all children below the age of six, including information about all nutritional deficiency symptoms and all immunisations.

The *Balsevika* will organise the non-formal education and supplementary feeding programme based on the beneficiaries who have malnutrition signs or symptoms identified on their RMC card. The practical demonstration and non-formal education will be carried out in a phased manner, two or three times a week in two or three villages at a time. The entire nutrition education should be organised around the extension of growing supplementary food, cooking demonstrations and better utilisation of nutritious elements in the locally available foods.

The MCC non-formal education programme was successful in teaching health and nutrition practices while the FLIT was not. One factor may have been that the ANM was a good resource person in these subject areas. Hence, some modest participation of the ANM in the non-formal education programme of the *Balsevika/Anganwadi-*

*sevika* may be functional.

*Basic Maternal and Child Care Services (BMCCS)*: The basic package of BMCCS which we feel can be disseminated to all pregnant and lactating women in this micro-region of about 5,000 population will consist of the following items.

(i) *Family Household Census Card* will need to be maintained for all the approximately 1,000 families at the MCC in order to determine the total number of pregnant and nursing women and all children below the age of five.

(ii) For each family, separate cards for all married women between 12 and 45 years will need to be prepared on which present or future pregnancy and routine medical checks can be recorded along with all other morbidity conditions, malnutritional symptoms, medications, etc. In addition, separate cards for each child of 0-5 years will need to be made to record malnutrition symptoms, height and weight, morbidity or medications.

(iii) *Routine Medical Checks* will need to be made for all 1,000 families two or three times each year. These routine checks will provide the screening device for selecting 40-50 per cent as beneficiaries to be included in the feeding programme on the basis of malnutritional signs and symptoms. Each pregnant mother should have at least three routine antenatal checks. The informal training of *Dais* for all deliveries should be conducted with one or two visits soon after child-birth.

(iv) *A Supplementary take-home feeding programme* for all pregnant and lactating women and children below five showing malnutrition should be conducted, coupled with massive therapeutic doses of vitamin A and iron where these are called for. In addition to the feeding programme, demonstrations of cooking classes using locally available food recipes, applied nutrition gardens and kitchen gardens to raise more protective foods and 'food for work' programmes for women should be organised as a combined strategy to combat malnutrition and bring about self-reliance.

(v) Basic curative services for simple first-aid and common illnesses along with drugs should be provided at the MCC.

(vi) Immunisation against smallpox, tetanus and DPT, should be conducted for the total population of adults and children. Immunisation against TABC and polio should be taken up at the second stage.

(vii) *Non-formal* education classes twice a week for women and



*balwadis* (or *anganwadis*) for children should be organised in every village. The feeding take-home package and the curative services should be linked to the bi-weekly classes to ensure high participation. The 80 to 100 unit lesson course may be taught in a seasonally cyclical manner with breaks during peak employment periods.

**MCC+FLIT:** The experiment has demonstrated that the combined MCC+FLIT has deleterious effects on both the programmes. We would therefore recommend that these two education strategies be separated.

## 2. Functional Literacy

The experiment has demonstrated that in a very highly illiterate area, the motivation for and consequent attendance in literacy classes is low. In this type of area, the introduction of literacy classes should make a selective approach. Various strategies are possible:

- (a) A younger age-group, not used in the experimental phases but mentioned in our project design, of 10-14 year-old girls who may have dropped out of school, may have a much higher motivation for literacy. This age-group of adolescent girls who are just getting married may incidentally learn a great deal about their forthcoming role in marriage, child-bearing and child-rearing.
- (b) The pregnant group may be dropped from the literacy class as they are almost certain to have a break in their sequence of classes.
- (c) Classes should be organised less frequently, maybe 2 or 3 times a week and not late in the evening.
- (d) Functional literacy should be linked to an economic programme, like the employment for a group of 15-20 women who are put in charge of an applied nutrition programme (ANP) garden.

We feel that functional literacy was not given a fair trial in this project, in spite of the best efforts made.

## 3. Drop-outs and Non-participation

The problems of attrition in MCC and FLIT are entirely different. Since we are proposing only the extension of MCC on a wider scale of total coverage, we will deal with this problem for the recommended pattern of MCC only.



From our experience in household surveys we feel that the preparation of total listing or registration of pregnant, lactating or weaning women within any age-range target will pose no problem. The ANM and *Balsevika*, along with their 'team' of village *Dais* and *Anganwadi-sevikas* after appropriate initial and continued monthly in-service training, will need to work out a strategy of contacting the target couples in all villages and spend the initial month or two of the programme, motivating families with the help of village leaders, programme organisers and other officials and non-officials.

Since the modified and extended programme will have less emphasis on formal classes, participation will need to be recorded in different ways, for the different aspects of the programme – preventive health checks, immunisation and supplementary feeding. Since these latter aspects of the programme have a number of economic and medical benefits the mechanisms for obtaining fuller coverage should not be difficult to implement.

Similarly the non-formal education should be linked to some other economic benefits. The initiation of community ANP-type kitchen gardens funded under existing programme heads may be a source of permanent employment for 10-20 women. The extension of these into all villages and into individual kitchen gardens would also have direct economic employment benefits and indirect savings in food and nutritional benefits. The linkage will increase participation and decrease drop-out as employment was one major reason for non-participation or drop-out.

#### 4. Materials Testing

The production and pragmatic testing of locally relevant and understandable teaching materials with visuals is one necessary but not sufficient condition for this MCC integrated programme. Both the MCC and FLIT teaching materials, we feel, have not been adequately tested. The sequential problem we encountered was of first structuring the materials into unitised form with visuals linked to each lesson unit, and then having sufficient classes to test them, to prove the intelligibility and efficacy of each unit. The feedback system described in Chapter V indicates our experience in essentially the first round of this procedure. The materials have now had first round of testing and revision. We feel that the materials need at least one or two more rounds of testing and revision before we would feel confident that their



message content was pragmatic and they are ready for much wider dissemination.

The geographical and nutritional boundaries of materials' relevance and utility raise yet another issue. We are relatively confident that the primary problems of nutritional deficiency encountered in this drought-prone area of Telengana will probably not be relevant to the coastal areas of Andhra. Some problems may be common. Hence, a testing of unitised materials in any area is a necessary pre-condition before wide dissemination of the programme. We feel the Telugu materials produced for both MCC and FLIT should first go through one round of testing in the same district and revisions made. Then the materials should be tested in the Rayalaseema and Andhra coastal areas and revisions made according to their results, eliminating materials not considered functional for those areas. Thus, regional or district level materials can be evolved which would be relevant for all parts of Andhra Pradesh.

#### D. IMPLICATIONS

This experimental (action-cum-research non-formal education) project for rural women integrating maternal and child health, nutrition, child-care and family planning was conducted primarily to test two or three models of delivery and evolve a basic package programme. The second phase experiment of the project should have run parallel to the ICDS scheme and experiences could have been exchanged from different parts of India. The completion of both experimental phases of this project in one state, Andhra Pradesh, along with results, however, will be very useful for the ICDS scheme which is just being launched.\* The non-formal teaching materials produced, the experiences with the delivery of the basic package of services, the record-keeping and monitoring system, along with all the failures and success stories will have some direct relevance for the ICDS scheme.

The ICDS scheme itself is being initiated on an experimental basis in 30 blocks. The objectives have been fairly clearly specified and hence monitoring and evaluation should not be too difficult. Measurable changes in health and nutritional knowledge, morbidity particularly in malnutrition signs, infant and maternal mortality rates, growth rates of children and an overall improvement in diets, should

\*The ICDS Scheme was launched in 1975.

be recorded continuously and in two or three cross-sectional surveys. A standardised record-keeping and monitoring system can provide up-to-date administrative intelligence for the entire scheme and also provide a frame for more in-depth evaluation and research. Corrective measures should be taken early so that year by year, ineffective or inapplicable parts of the programme are culled out, and adequate improvements made to make those parts of the programme effective.

Experimental knowledge and understanding of difficulties faced as the new programme begins and sympathetic supportive action will be called for before this child development scheme can take root. The direct implications of the results of this experimental project are spelled out in this concluding section of the chapter.

# 1. Comparison of Proposed MCC with ICDS

A brief comparison between the ICDS scheme for a rural area and the operational part of the MCC which we would recommend is presented below:

	MCC <sup>1</sup>	ICDS <sup>2</sup>
(a) Coverage (population):	60,000	100,000
(b) Staff:		
Medical:	1(+1)* Doctors 2(+2)* Public Health Nurses 6(+6)* ANMs 60-80 <i>Dais</i>	1(+1)* Doctor 2(+2)* Public Health Nurses 8(+8)* ANMs
Nutrition and education:	1 Child Devl. Officer 1 Asstt. C.D. Officer 12 <i>Bal-sevikas</i> 48 <i>Anganwadi-sevikas</i>	1 CDPO.  5 Supervisors 100 <i>Anganwadi-sevikas</i>

\*Numbers within parentheses denote positions already on block staff.

<sup>1</sup>Project proposal entitled "Pilot Project on Integrated Child Development and Population Planning", Council for Social Development, July, 1975.

<sup>2</sup>ICDS Scheme, op. cit.



## (c) Costs: (rupees)

1. Personnel	1,70,000	2,82,800
2. Recurring	88,000	62,000
3. Non-Recurring	1,00,000	1,35,000
	<hr/>	<hr/>
	3,58,000	4,79,800
	6,18,000	
4. Feeding	3,60,000	8,98,500

Although staff costs are similar in respect of the coverage of the two schemes, there is one basic structural difference in spatial operational management. While the MCC scheme has a three-tier system of staffing, namely, block, micro-region and the village, the ICDS seems to have a two-tier system of the block and the village with separate supervisory areas for the ANMs and Child Development Supervisors. The focus of the delivery strategy is to establish and strengthen the MCC as a viable delivery unit for the package of services. The MCC envisages a team approach of the ANM plus the *Balsevika* located in a central accessible service village who will together cover a micro-region with a population of 5,000 or about 5 villages. The MCC micro-regional team will include: the ANM, the *Balsevika*, four *Anganwadi-Sevikas* and six to eight village *Dais* from the four villages served by the MCC service village. Each of these 12 micro-regional MCC units will have a weekly upward articulation with the two doctors and four Public Health Nurses and the Child Development Officer and her assistant at the Primary Health Centre which will be the referral medical base with a 30-bed in-patient hospital facility. Logistic costs can also be cut by joint tour programmes to the MCC service villages.

The medical strategy would be to devolve the entire immunisation, routine checks, and 90 per cent of the common curative services to the peripheral MCC centre. Only difficult maternal cases, illnesses and potential referral cases will be put up for the weekly doctor and nurse visits on specified days. The routinisation of weekly visits with all the 12 centres will progressively weave the 12 MCCs and the 60 villages into a sense of belonging to an integrated maternal health and child development system.

A monthly up-to-date report prepared for the monthly two-day refresher courses at the PHC headquarters of all health and nutritional staff will further set up a two-way communication link-up on problems and their solutions. A review of the past month's performance and



preview of the coming month's work will form the curriculum of these refresher courses. This touring system will bring the headquarters staff into contact with the MCC level staff at least on four or five occasions every month and every one of the MCC staff will meet each other at least once a month.

## **2. Pilot Phase of MCC**

This project was designed in three phases. The first two were experimental phases in which the staffing pattern was more intensive and the programme beneficiaries were the experimental subjects or guinea-pigs for a wide spectrum of testing and re-testing. This was done to operationalise materials and evolve a delivery system by testing the relative efficacy of three different systems. The experiment was to select the most effective system and specify its staffing, supervision and costs. The third pilot phase is to recommend one system and test it out more widely in an entire block or PHC area.

This report and the related teaching and training materials bear testimony to the successes *and* failures of the experimental phases of this project. The description of the third phase along with the staffing and costs are contained in the project proposal entitled 'Integrated Child Development and Population Planning'. This project had selected one PHC area of about 60,000 population for testing the basic maternal and child care services (BMCCS) so that it can be compared with a similar block where the BMCCS will be combined with a population planning scheme. In two other blocks, the population planning scheme alone will be compared with a control block. This control block will also be the control block to test the effectiveness of the BMCCS. Thus, the BMCCS block and control block both act as controls for the two population planning blocks. The four blocks, therefore, act as four pairs of experimental tests. The integration of a separately-funded family planning component to this third phase came as a later development, not related to the two experimental phases of the Non-formal Education Project.

We feel convinced that results of the experimental phases should now be given a fair trial in a pilot phase. The materials prepared and the model evolved can then be tested more widely in one block to demonstrate their efficacy.



### 3. Materials Testing, Monitoring and the Strategy of Research

As indicated earlier, we feel that the teaching materials prepared have not been adequately tested. The feedback system had been designed but was not fully operationalised. The unitised materials and visuals can now undergo a fairly thorough feedback and revision, unit by unit. Appropriate trials can be made on adequate samples of pupils with a wider range of teacher ability which will lend greater confidence to the testing of the materials.

The record-keeping system for both the educational component and the health and nutritional components have not been designed for this new BMCCS model. Since the programme will be far larger and more widespread, a very much simpler yet complete system will be needed.

Third, the measurement of the effectiveness of the programme by a tri-annual record-keeping and annual cross-sectional Re-surveys over a five-year period will systematically appraise the effectiveness of various components of the project. On-going, evaluative in-depth studies of the roles of various functionaries will help an early identification and correction of their felt problems. The entire nutritional staff infra-structure – Child Development Officer/*Balsevika*, *Anganwadi-sevika* – are brand new functionaries. Hence, their orientation and performance in these new roles may suffer from some initial growing pains.

*Social Experimentation:* The Council for Social Development is basically a research institution. This project was the first venture in which action programmes have been undertaken by the Council in order 'to evolve through experimentation' a model for wider dissemination. While this kind of experimental research is common in biological and physical sciences, social experimentation, as we have pointed out, is fraught with many more scientific dangers because of the inability to 'control' extraneous factors. Despite this limiting factor, the experience has convinced the Council that as a policy it should undertake experimentation. Compared with one or even two or three cross-sectional surveys, what can be learned from working with field workers and village participants at the receiving end, can yield a quantum leap into knowledge and wisdom about social development.

By the process of serendipity, one conclusion that we may draw is that social science research institutions should undertake experimental projects which would involve them directly in real-life action programmes. The more specific recommendation that we would derive

for the ICDS Scheme, is that in addition to the Programme Evaluation Organisation's cross-sectional evaluation surveys, three or four social science *research* institutions should *conduct* at least one or two of each of the 16 rural, four urban and 10 tribal ICDS projects.

The additional *research* costs will be small when compared with the *action* costs which will total over 5 years 11-24 lakhs per project (excluding the feeding programme costs of 30 to 45 lakhs), i.e., a total of 5 crores (plus 12 crores for feeding costs). This parallel strategy of research will supplement, complement and lend confidence to the PEO evaluation to determine the 'success or failure' of the project. Far more importantly, it will suggest changes in the structure of the operation of various aspects of the programme even within the experimental life of the scheme. For indeed, if ICDS is ever going to be a national commitment to India's young children, it will be the economies that can be effected and the self-reliance built into the programme operation that would make it so. It will not be enough to brand the scheme with one of those two over-simplified labels - 'success' or 'failure'.

#### 4. Lightening the Burdens

In one of the earliest critiques on this project, Mr. Heyward of UNICEF, New York, posed the question as to whether we could not 'lighten the burdens' of the women in these backward areas. The critique was well-received but nothing could be done at that time to the on-going experiments. The way we interpreted the critique was: 'Could not the project be linked to economically-rewarding programme?' This called for much higher levels of participation along with better standards of living.

In this third pilot phase, a great deal of effort will be made to skilfully weave into the programme some direct, economic, wage-earning components and some indirect savings by production of commodities which are nutritionally beneficial or projects which save the women time, money and energy. Some examples of these economic interventions which will result in individual or community-owned assets are:

- (1) *An Applied Nutrition Programme (ANP) garden* established serially, village by village, based on some form of participation-reward system. Employment at the time of establishment and for



its operation and maintenance may be created and paid, partly in kind as nutritionally balanced food, to pregnant and lactating women of the village, so they don't have to travel for or migrate for work. The extension of ANP gardens to all villages and further to individual kitchen gardens will eventually raise the threshold of protective food production and consumption. Ultimately, there will be sufficient to provide marketable margins.

- (2) Community latrines and *Gobar* gas plants to recycle refuse and night soil into high grade manures plus cooking gas, saving the women time and fuel costs and incidentally resulting in better environmental sanitation.
- (3) Organising non-profit cooperatives of all young women of 15-40 years to manage the MCC centres, ANP gardens, etc. and preferably employ women of their own village as *Balsevikas*, *Anganwadi-sevikas*, *Dais* and so forth. If profitably managed a network of 12-MCCs with *Gobar* gas plants and 12-60 ANP gardens could have substantial turnovers which in five years could become self-supporting.

Even a modicum of success on this economic front of fuller and more convenient employment of womanpower may energise the entire project. The organisational component of women's cooperatives has a politico-social dimension and we have here an enormous potential for tapping sources of long-subjugated energy.

# APPENDIX 18

TABLE I: Summary of gain scores between Bench Mark (BM) and Resurvey (RS) on major variables and sub-scales in each experimental treatment (Phase II)

Variables	Experimental treatments			
	CONT (N=114)	FLIT (N=12)	MCC (N=94)	MCC+FLIT (N=104)
<i>I. Health care:</i>				
A. General health (6 items)	0.95	1.17	1.69*	1.50*
B. Child health (3 items)	-0.08	0.25	0.59*	0.35*
C. Child disease (6 items)	0.92	1.00	2.20*	1.66*
D. Pregnancy (2 items)	0.46	0.92	1.14*	1.25*
Total (17 items)	2.25	3.33	5.62*	4.76*
Standardised score	0.13	0.20	0.33*	0.28*
<i>II. Nutritional care:</i>				
A. General nutrition (8 items)	1.11	2.25	3.87*	2.95*
B. Pregnancy (4 items)	0.06	0.42	1.28*	0.83*
C. Lactation (3 items)	0.86	0.58	1.63*	1.37*
D. Child (3 items)	0.77	1.83*	2.80*	2.31*
Total (18 items)	2.80	5.08	9.57*	7.45*
Standardised score	0.15	0.27	0.50	0.39
<i>III. Taboos:</i>				
A. Pregnancy (12 items)	0.02	0.00	1.15*	1.20*
Standardised score	0.00	0.00	0.10*	0.10*
B. Lactation (12 items)	2.14	1.00	2.80	1.84
Standardised score	0.18	0.08	0.23	0.15
<i>IV. Nutrition facilities: (3 items)</i>				
Standardised score	0.14	0.42	0.64*	0.55*
<i>V. Family planning:</i>				
A. Knowledge (5 items)	0.03	0.33*	1.34*	0.90*
Standardised score	0.01	0.07*	0.27*	0.18*
B. Attitude (5 items)	0.40	1.58*	2.09*	2.01*
Standardised score	0.08	0.32*	0.42*	0.40*

(Contd.)



TABLE I (Contd.)

Variables	Experimental treatments			
	CONT (N=114)	FLIT (N=12)	MCC (N=94)	MCC+FLIT (N=104)
VI. Literacy (change in per cent marks):				
A. Reading (64 items)	-0.39	39.90*	0.60	7.90*
B. Writing (6 items)	-1.32	7.00*	-0.76	0.66*
C. Arithmetic (29 items)	-0.24	30.33*	0.17	2.95*
Total (99 items)	-0.68	25.33	-0.03	3.69*

\*Significant at 0.05 level.

TABLE II: Mean number of nutritional deficiency signs of service (MCC and MCC+FLIT) and non-service (CONT+FLIT) groups (Phase II)

	Non-service		D	Service		D
	BM	RS		BM	RS	
I. Nutritional deficiency signs (children):						
A. P.C.M. (3 items)	.41	.90	+.49	.56	.77	+.21
B. Vitamin A (3 items)	.26	.22	-.04	.29	.09	-.20
C. Vitamin B (4 items)	.18	.19	+.01	.04	.01	-.03
D. Iron (4 items)	.67	.27	-.40	.55	.33	-.22
Total (14 items)	1.52	1.58	+.06	1.44	1.20	-.24
II. Nutritional deficiency signs (women):						
A. P.C.M. (3 items)	.10	.29	+.19	.21	.18	-.03
B. Vitamin A (3 items)	.97	.33	-.64	.90	.11	-.79
C. Vitamin B (4 items)	.97	1.31	+.34	.90	.11	-.23
D. Iron (4 items)	1.88	2.07	+.19	2.25	1.23	-1.02
Total (14 items)	3.96	4.00	+.06	4.26	2.19	-2.07
III. Weight for Age: (per cent of Harvard Standard)						
Infants			-16.95			-4.84*
Toddlers			-0.59			5.99*

\*Significant at 0.05 level.

TABLE III: Mean, motor and mental deviation scores at Bench Mark and Resurvey by treatments (Phase II)

Treatment	Bench Mark		Resurvey	
	Motor deviation	Mental deviation	Motor deviation	Mental deviation
CONT+FLIT	+0.07	-0.02	-1.33	0.00
MCC	+0.13	+0.06	+2.43	-1.08
MCC+FLIT	+0.03	+0.14	+2.78	-1.30

TABLE IV: Summary of gain scores between Bench Mark (BM) and Resurvey (RS) on cognitive structure of adult women as measured by Lowenfeld Mosaic Test (Phase I)

		Experimental treatments			
		CONT (N=43)	FLIT (N=14)	MCC (N=43)	MCC+FLIT (N=33)
1. Time taken to complete the mosaic design (sec.)	$\bar{X}$	-17.23	+174.57	+77.78	+153.64
	SD	+4.62	+84.98	+4.15	+81.01
2. Total number of pieces used	$\bar{X}$	+4.41	+3.86	-0.54	+5.58
	SD	+3.67	+0.37	-3.41	-0.85
3. Number of sub-designs	$\bar{X}$	+0.07	+0.50	-0.21	+0.45
	SD	+0.30	+0.64	-0.44	+1.32
4. Area of tray covered	$\bar{X}$	+5.72	+7.07	+2.14	+0.39
	SD	+5.74	+0.27	-0.80	-5.03



TABLE V: Total programme and per capita costs and relative effectiveness of three experimental treatments (in rupees)

Costs and variables of effectiveness	Experimental treatments		
	FLIT	MCC	MCC+FLIT
<i>A. Costs</i>			
1. Total programme cost	22,892	66,917	66,917
2. Per-capita costs	789	443	449
3. Targeted beneficiary cost	125	280	280
<i>B. Relative effectiveness</i>			
1. Health	731	132	179
2. Nutrition	346	65	97
3. Taboos	0	248	510
4. Facilities	8,767	2,769	3,454
5. Family planning	533	148	181
6. Literacy 3 R's	30	N.A.	103

## APPENDIX 19

### LIST OF PROJECT REPORTS PREPARED FOR SEPARATE PUBLICATION

1. T.A. Koshy, "Integrated non-formal education for mothers". *Social Change* 1 (March & June) 1973: 28-32.
2. Experimental project begins in Indian village. *World Education Reports* 2 (Fall) 1973: 1-5.
3. Prodipto Roy, "Non-formal education for rural women". *World Education Reports* 2 (Fall) 1973: 8-10.
4. Prodipto Roy, "Monitoring a non-formal education project". Background paper for International Workshop for Evaluation Specialists on Non-Formal Education for Family Life Planning. Chiangmai, Thailand, June 9-23, 1974.
5. Victor Jesudason, "Some problems in surveys of dietary intake". A paper presented at the workshop on Problems of Field Data Collection in Rural Areas. Singapore, November 2, 1974.
6. Prodipto Roy, "An Indian workshop on evaluation: learner needs, materials, teachers and training". *Literacy Discussion* (Fall) 1974: 409-420.
7. Prodipto Roy, "Field realities modify research design". *World Education Reports* 9 (June) 1975: 5-7.
8. Victor Jesudason, "Open-ended and close-ended questions: Are they complementary?" *The Journal of Family Welfare* 23 (September) 1976: 66-68.
9. T.A. Koshy, "Literacy Education in development". Pp. 154-159 in R.O. Niehoff and K.L. Neff (eds), *Report of Conference and Workshop on Non-Formal Education and the Rural Poor*, College of Education, Michigan State University, 1977.
10. Shalini Bhogle, "Effect of supplementary food on motor development of rural infants". A paper presented at UGC Seminar on Pre-School Child organised by the Home Science College, Sri Venkateswara University, Tirupathi, 1977.
11. Victor Jesudason, "A causal model to explain sources of errors in demographic data". *The Indian Journal of Social Work* 38 (April) 1977: 51-60.
12. Shalini Bhogle, "Some facets of mental development of deprived infants". *Indian Journal of Applied Psychology*, 1977.
13. Victor Jesudason, "Midwifery practices of village dais in Mahbubnagar Taluka". *Archives of Child Health* 19 1 (September) 1977: 115-121.
14. Victor Jesudason, "Determinants of fertility behaviour in a non-



- contracepting population". *The Journal of Family Welfare* 25 (March) 1978: 3-13.
15. Anita Dighe, Prodipto Roy, T.A. Koshy and Victor Jesudason, "Curriculum development for an experimental non-formal education project for rural women in Mahbubnagar District, Andhra Pradesh - A Case Study". Background paper presented at Regional Experts Meeting on Literacy in Asia, Bangkok, November 22-28, 1977. Also presented at the International Seminar on Curriculum Development for Basic Education Programmes, West Berlin, June 12-21, 1978.
  16. Victor Jesudason and K.R. Ambujadevi, "Socio-economic factors and demographic characteristics as determinants of nutritional status of rural women". *The Journal of Family Welfare* 25 (September) 1978.
  17. Victor Jesudason, "Sample Attrition in a longitudinal survey". *Sankhya: The Indian Journal of Statistics* 40 (Series C Pt 2) 1978.
  18. Victor Jesudason and Rajni Shirur, "Cultural factors of food consumption in Telengana region of Andhra Pradesh, India". A paper presented in X International Congress of Anthropological and Ethnographical Studies, India, December 10-21, 1978.
  19. Chittamma Rao, "Development and Evaluation of Nutrition Material for Non-Formal Education for Rural Women", Unpublished Ph.D. Thesis submitted to University of Madras (Home Science) 1978. Guide: Rajammal P. Devadas.
  20. Victor Jesudason, "A note on structured and unstructured questions in surveys". *Kerala Sociologist* 6 (December) 1978: 18-20.
  21. Victor Jesudason, K.R. Ambujadevi and Shalini Bhogle, "Relationship between socio-economic status, demographic characteristics, nutrition status, and mental/motor development of young children". *Indian Journal of Social Work* 40 (April) 1979.
  22. Prodipto Roy and Victor Jesudason, "Research combines with action in Indian villages". *World Education Reports*, 18 (January) 1979: 17-18.
  23. Sunanda Mitra, "An estimate of under-enumeration while developing a sampling frame". *ICSSR Occasional Papers on Research Methodology* 1, 1979.
  24. Victor Jesudason, "Variations in investigator's performance in sample survey as a source of non-sampling errors". *ICSSR Occasional Papers on Research Methodology* 1, 1979.

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# MODERNIZING EFFECTS OF UNIVERSITY EDUCATION

Sharma, S.L.

A 31

Recent research on socialization outcomes of schooling has generated a widespread optimism that education promotes individual modernity. The book calls into question such a view and advances some contradictory evidence on the role of higher education as a vehicle of attitudinal modernity. This is hardly surprising, for not all aspects of modernity as defined here are subject to variations in response to higher informational inputs - which is all that higher education can be said to provide. This notwithstanding, the study does reveal the importance of early schooling, particularly the type of school attended, as factor affecting modernity.

The book seeks to stimulate fresh thinking on all the three fronts - substantive, methodological, and theoretical. Above all, it stresses the need for evolving a national education policy treating education as a social resource for changing attitudes and values rather than viewing it as a mere economic resource for providing skilled manpower to a developing economy.

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